

FIG. 1

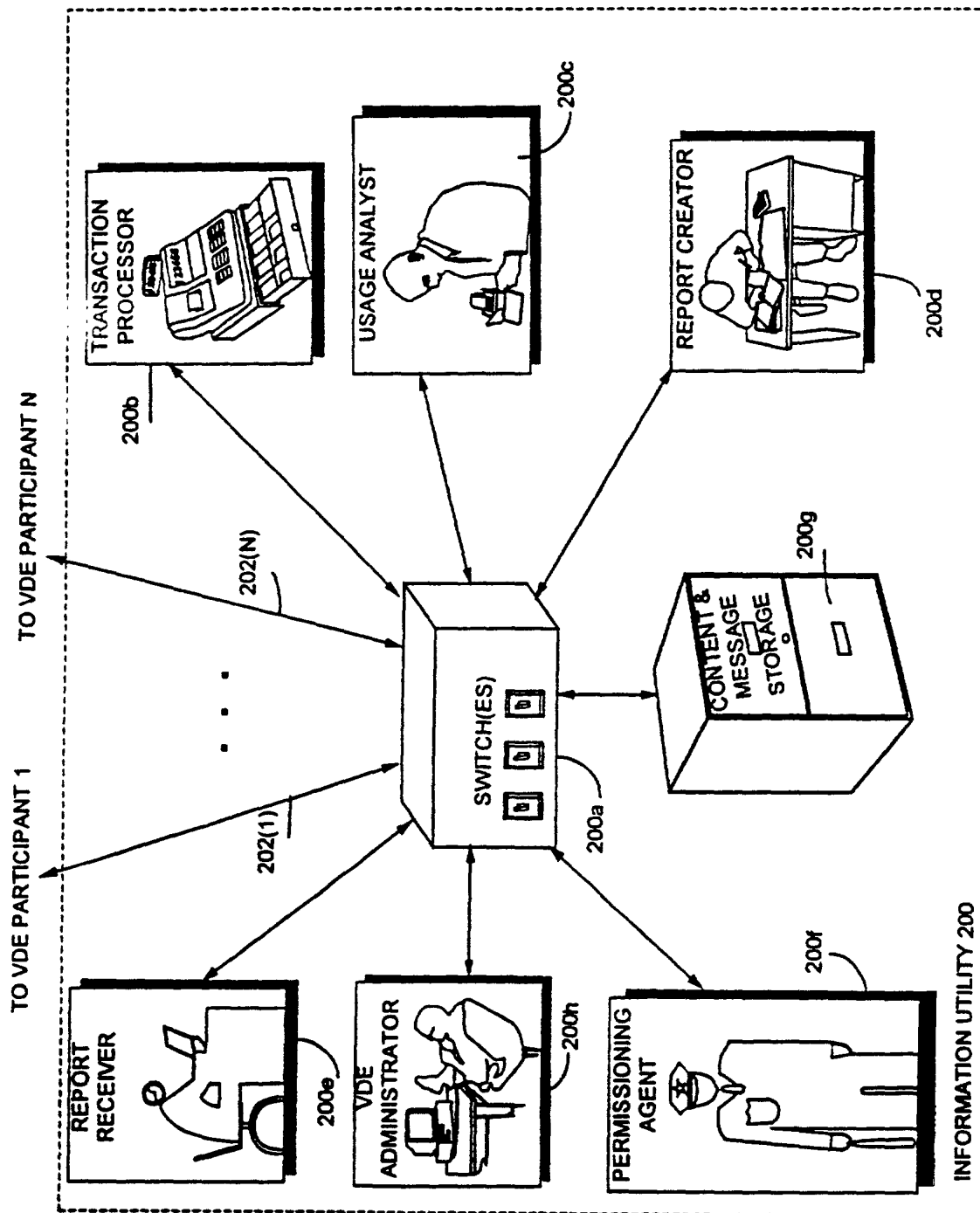


FIG. 1A

FIG. 2

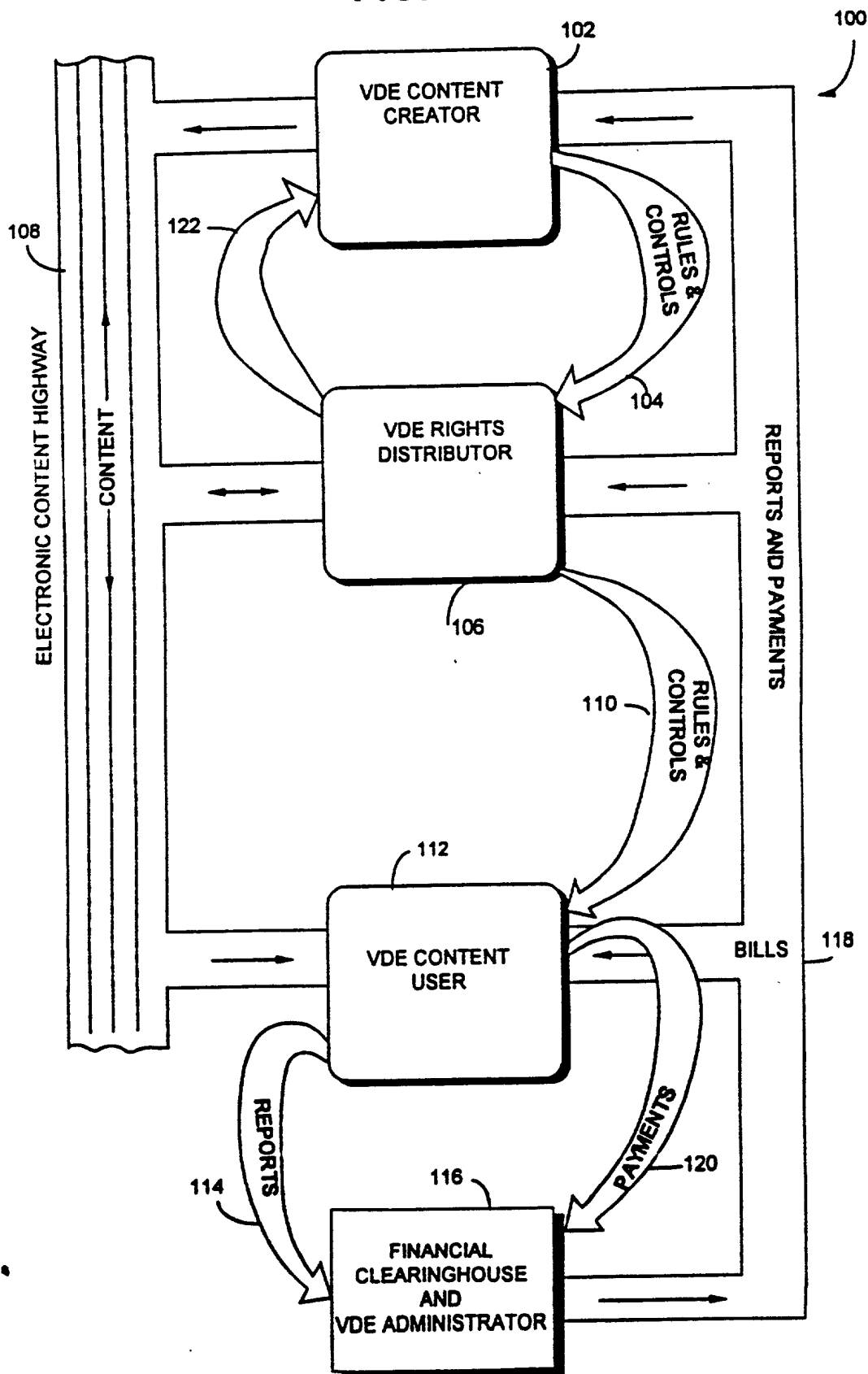


FIG. 2A

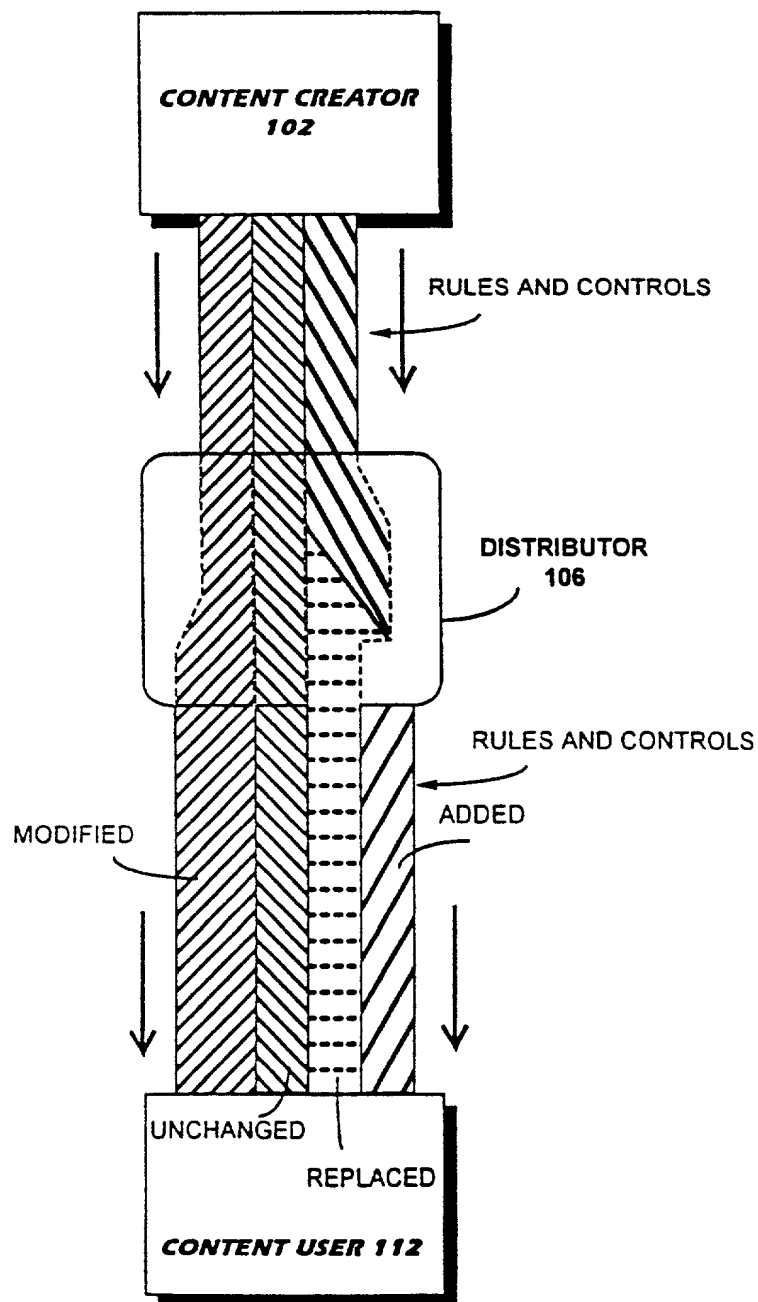
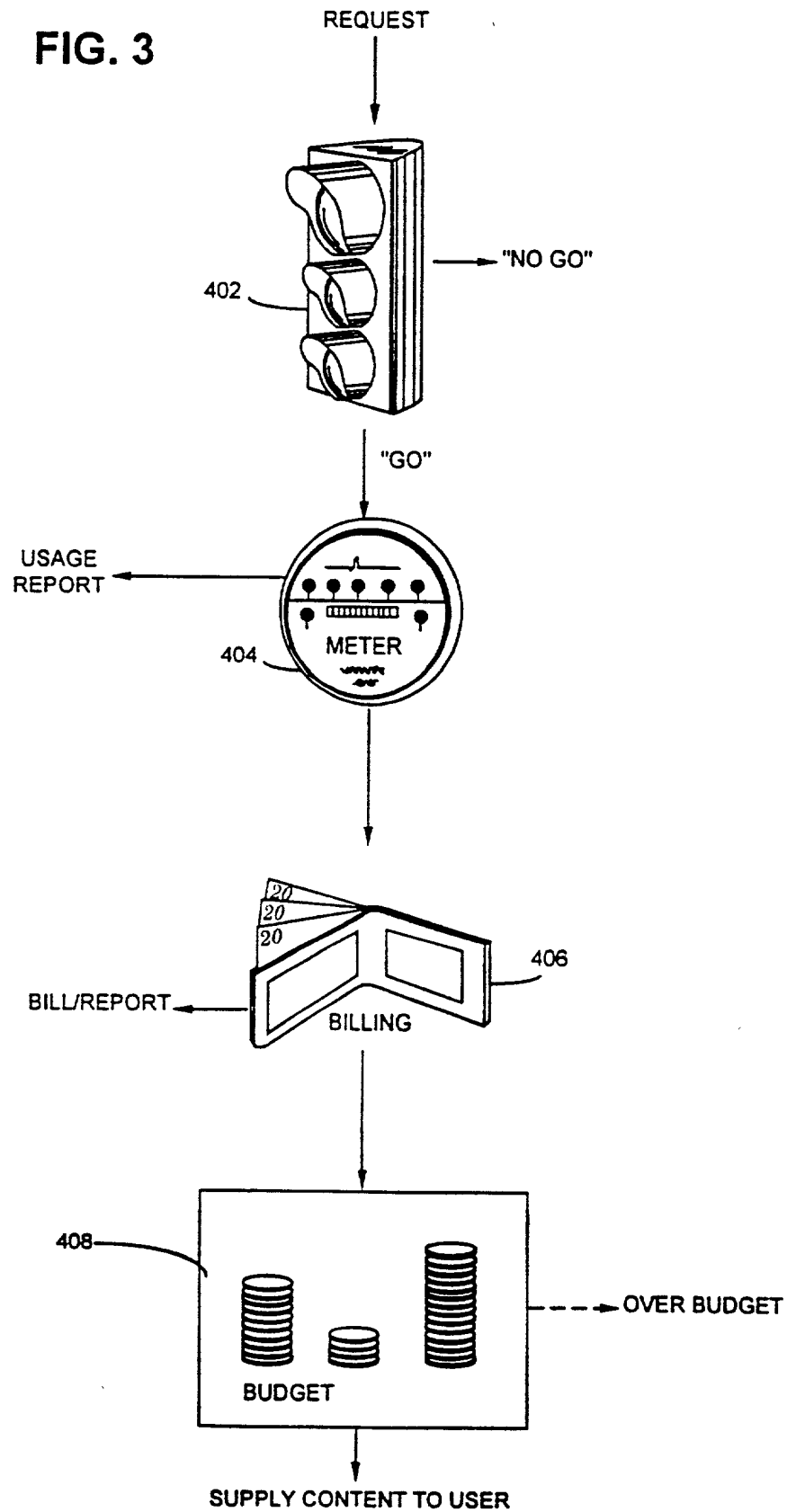


FIG. 3



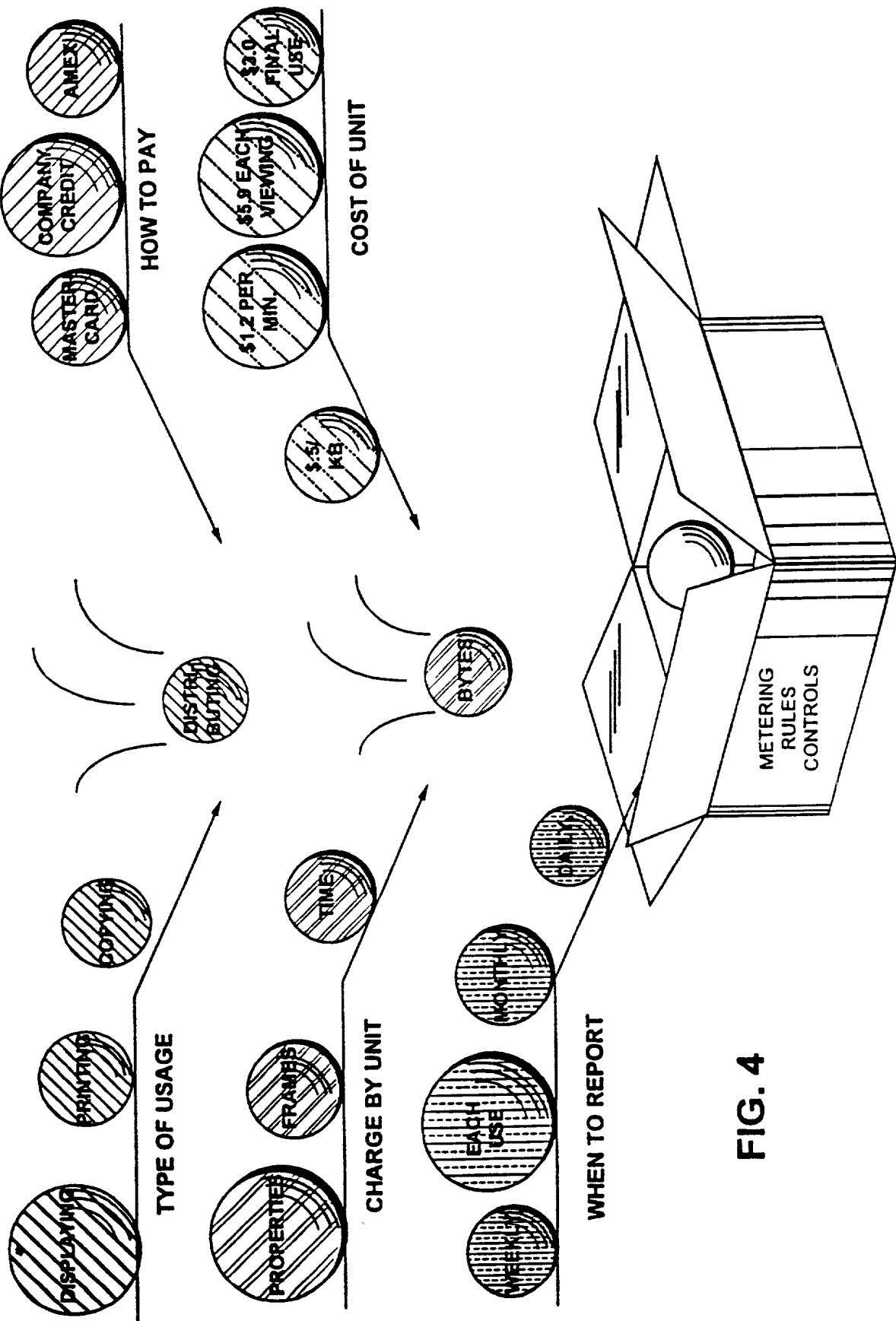


FIG. 4

FIG. 5A

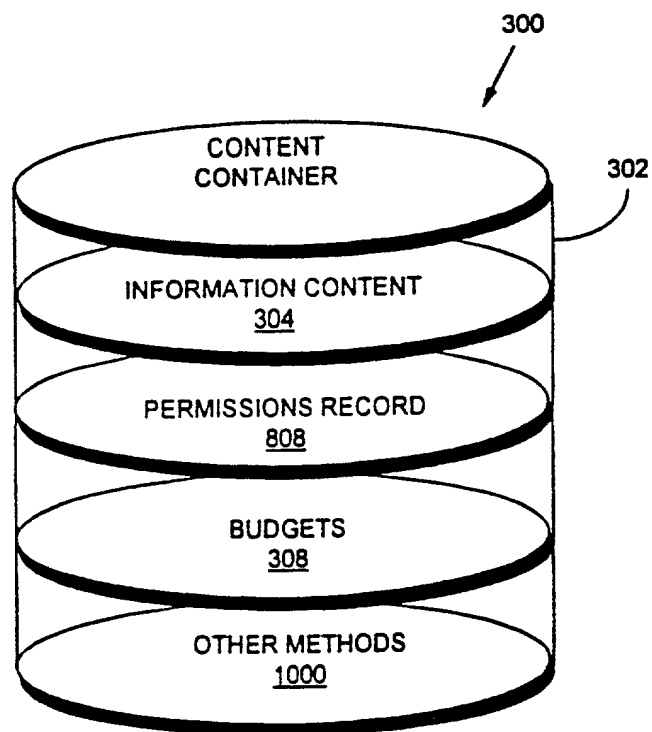


FIG. 5B

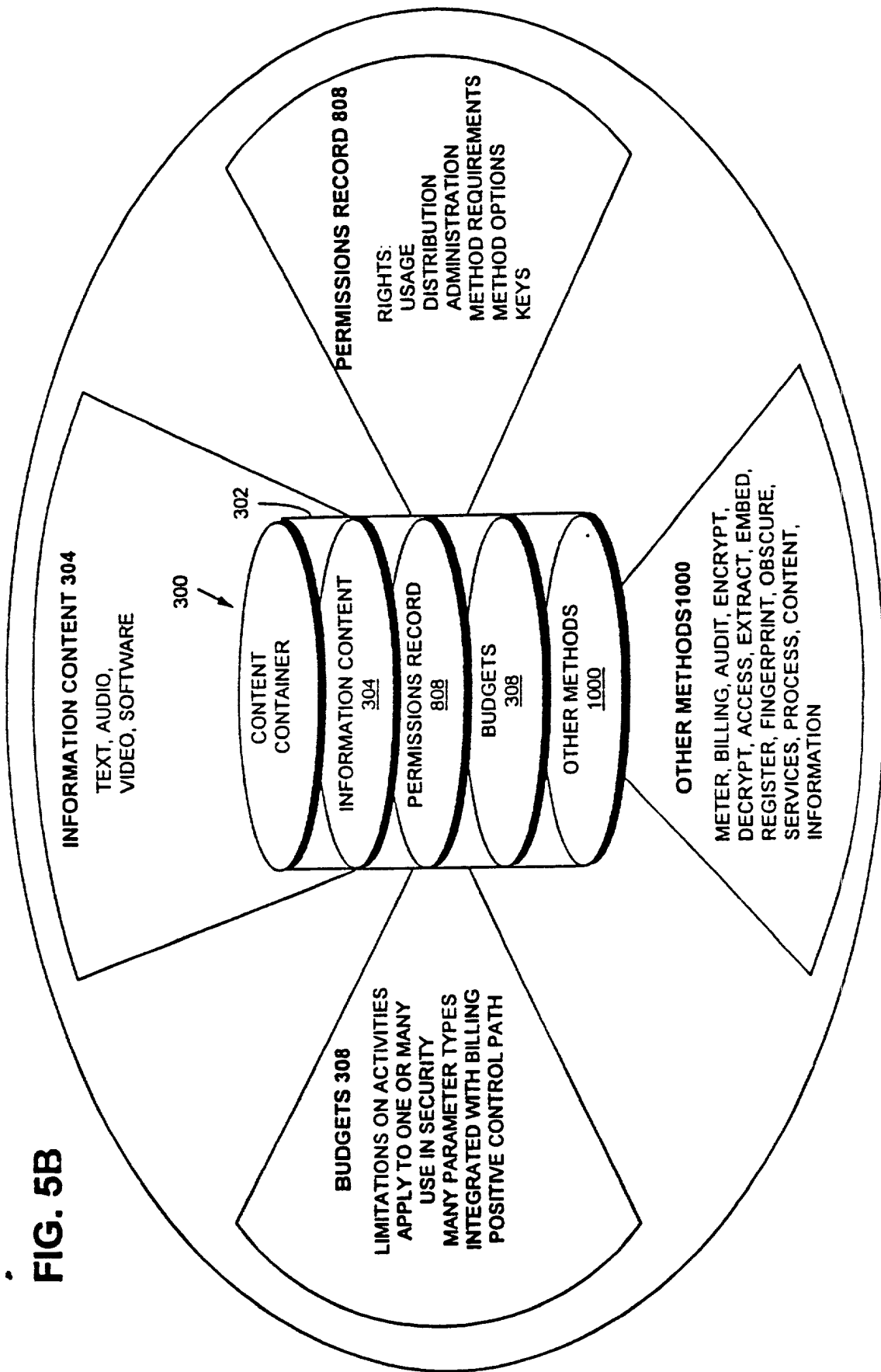
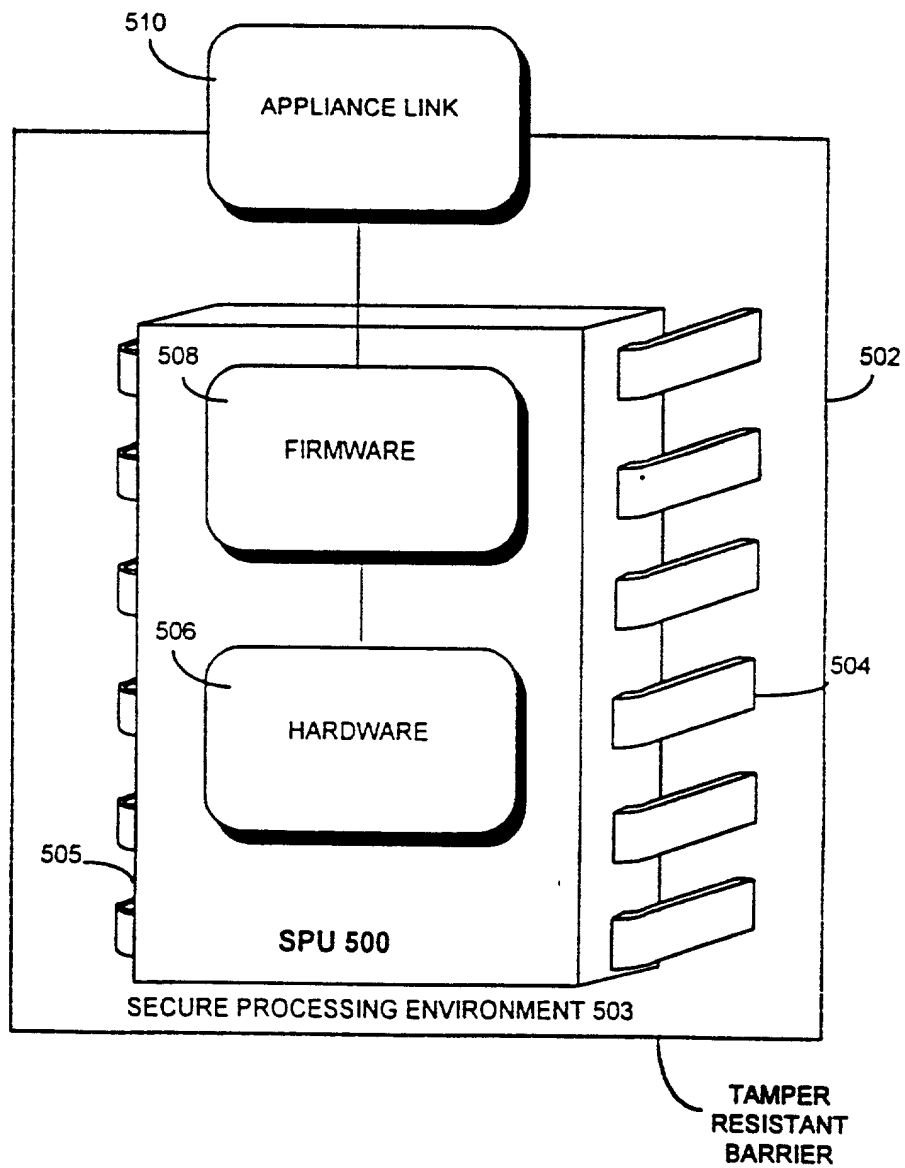


FIG. 6



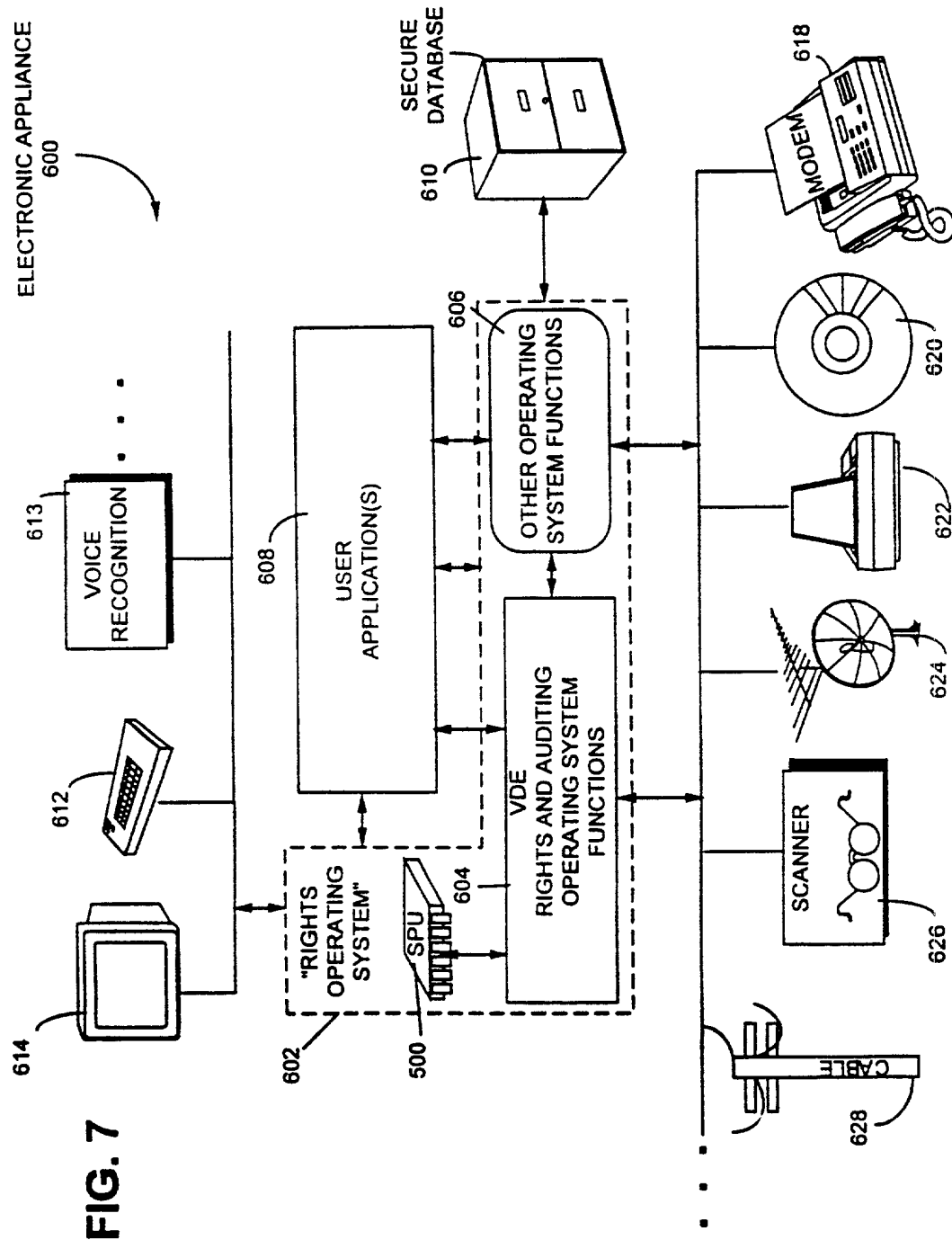
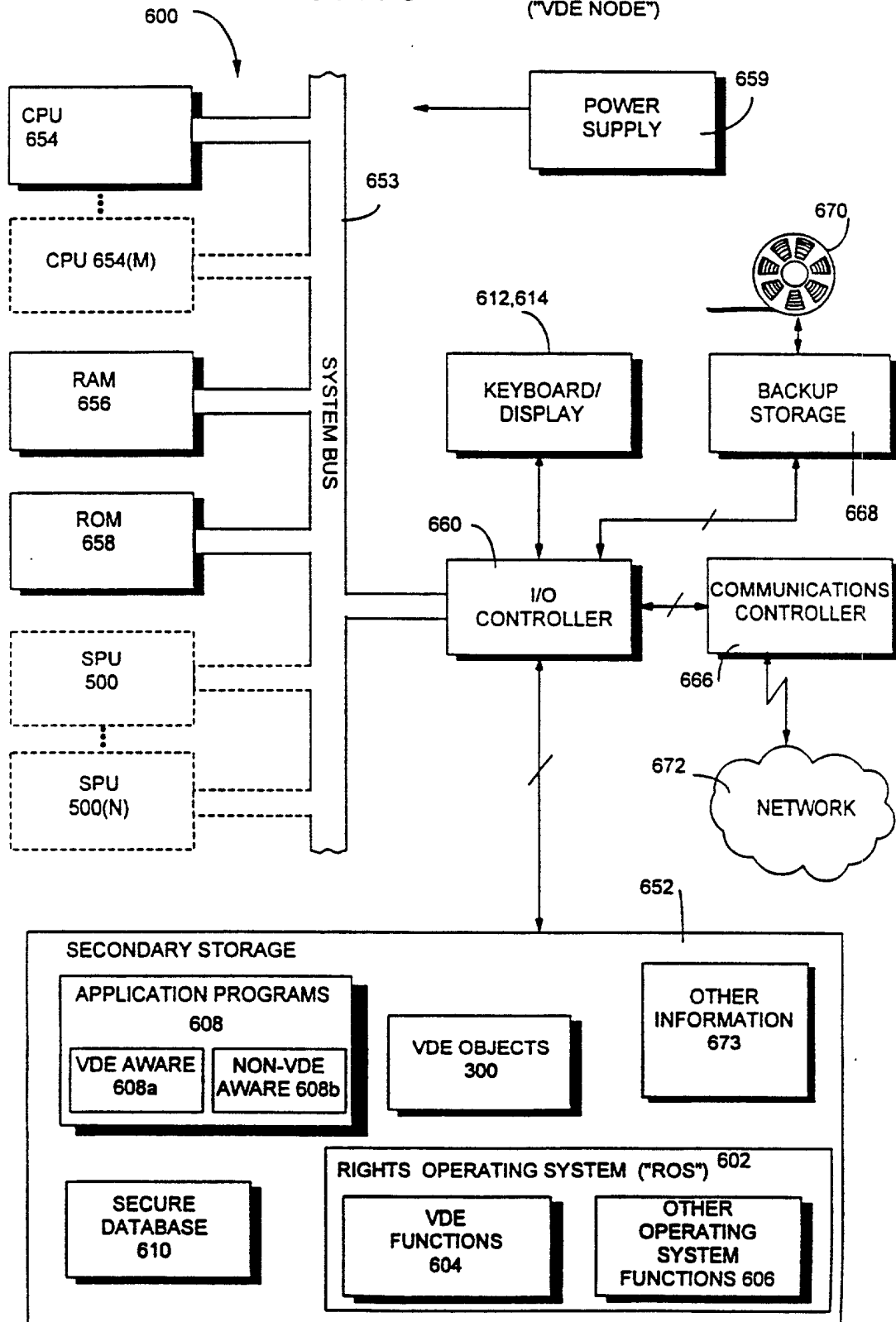


FIG. 8 ELECTRONIC APPLIANCE 600
("VDE NODE")



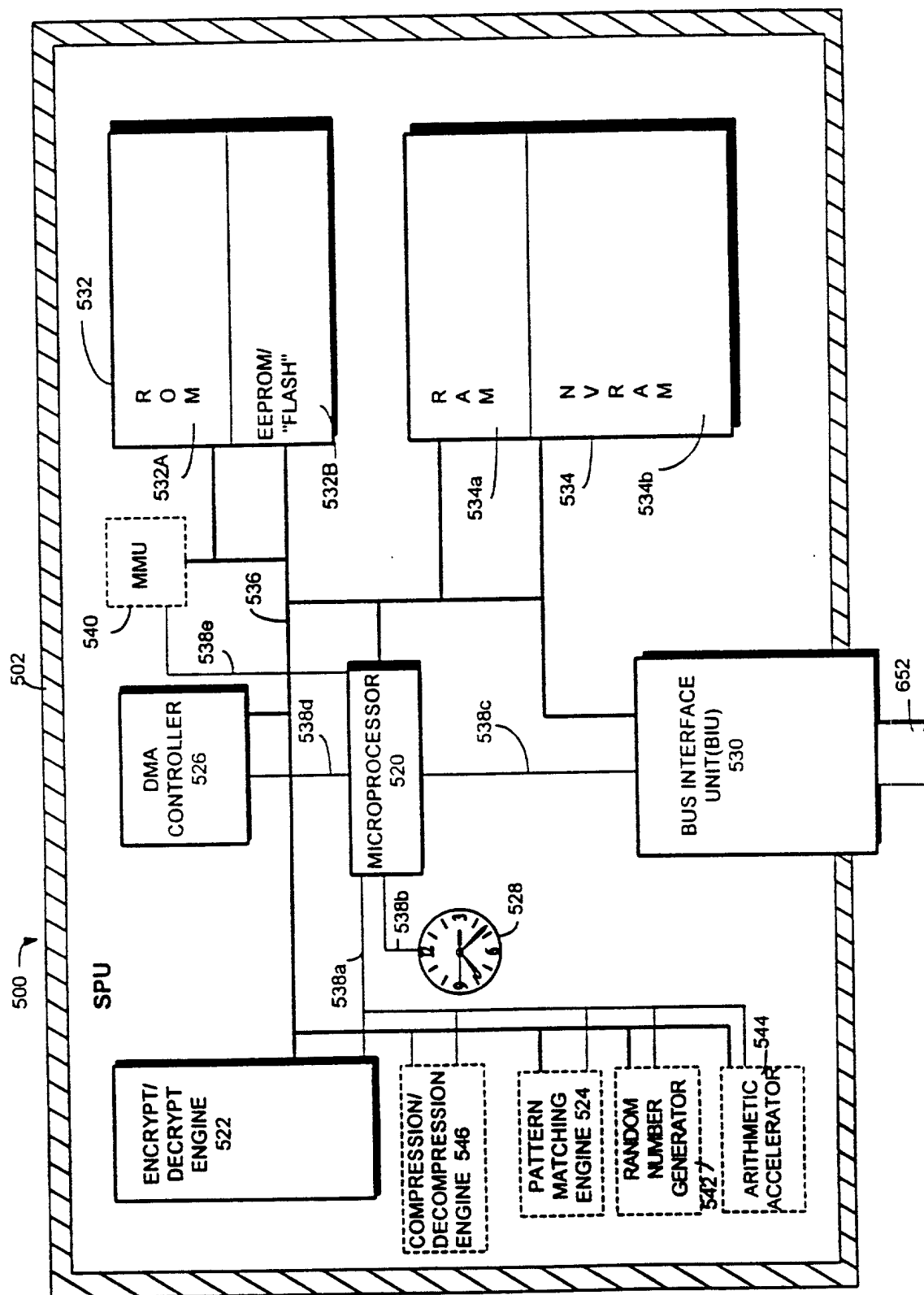


FIG. 9

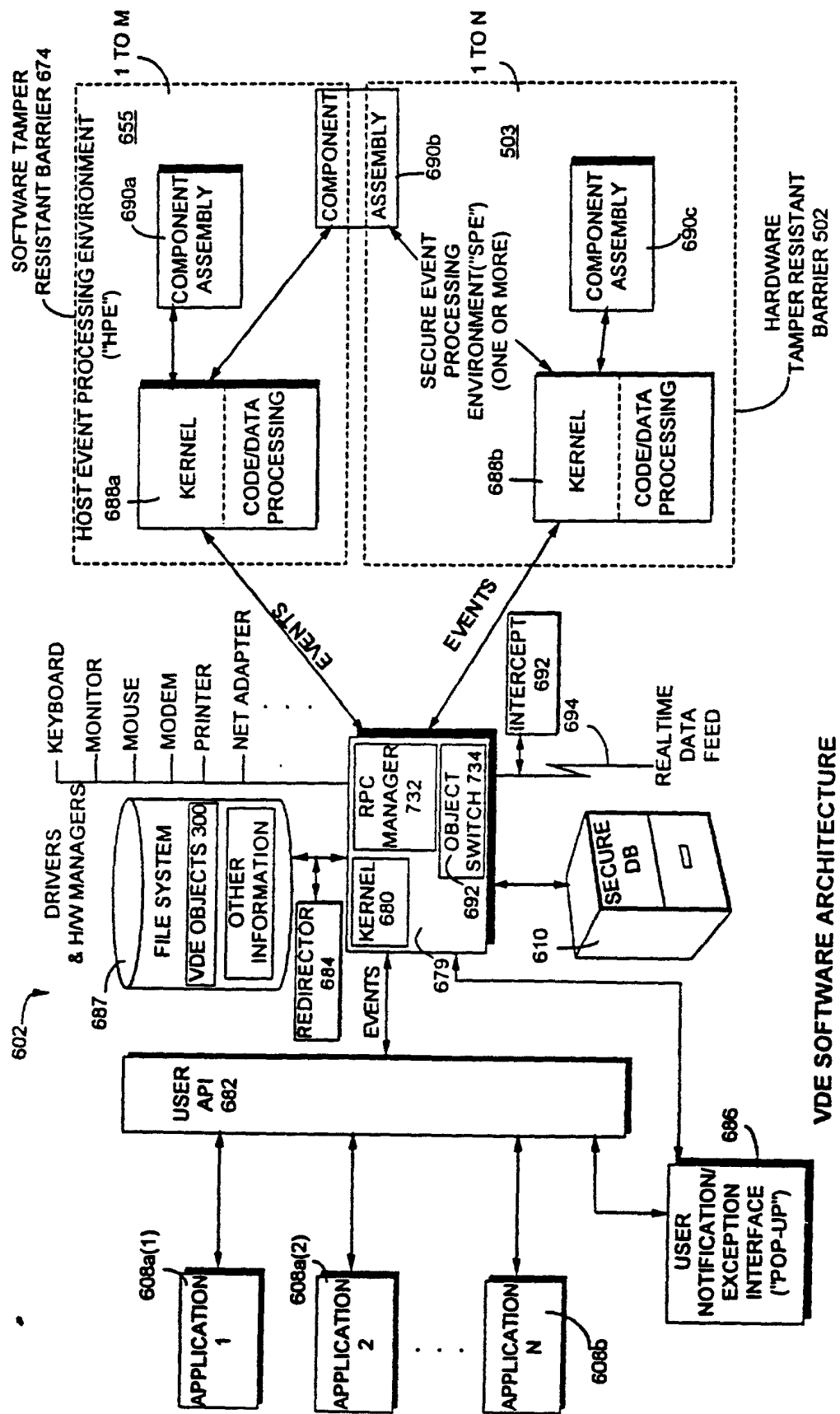


FIG. 10

FIG. 11C

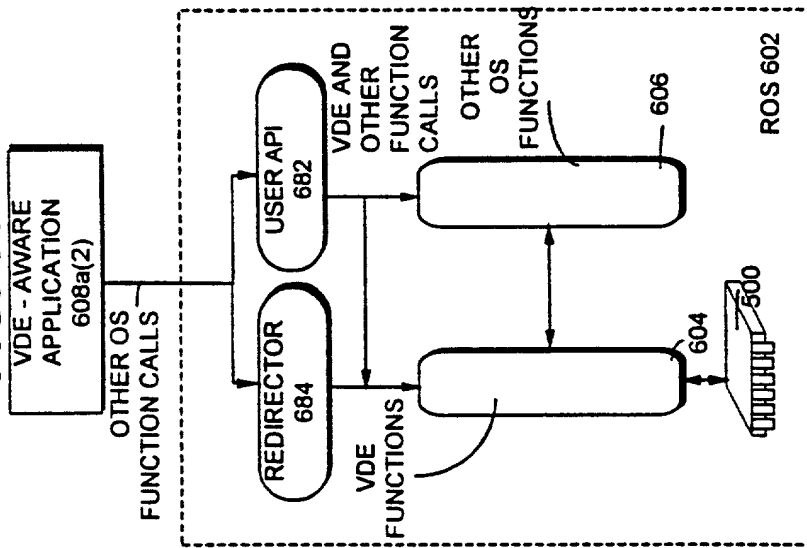


FIG. 11B

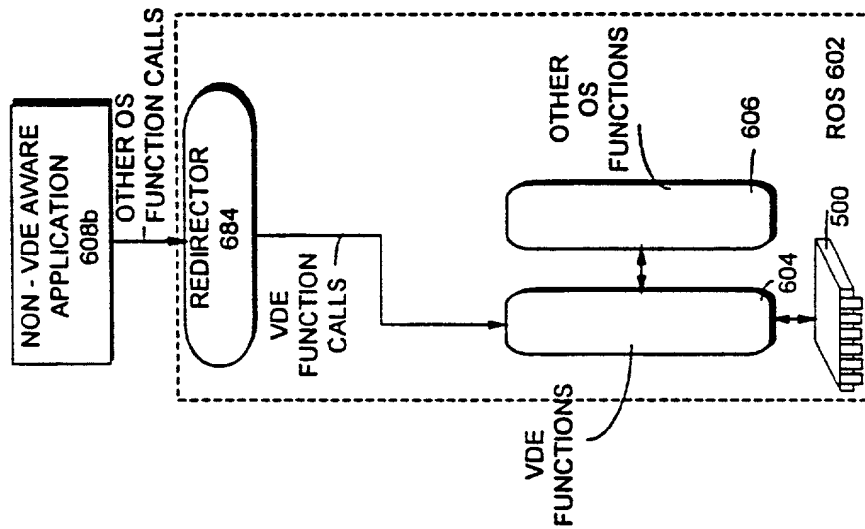


FIG. 11A

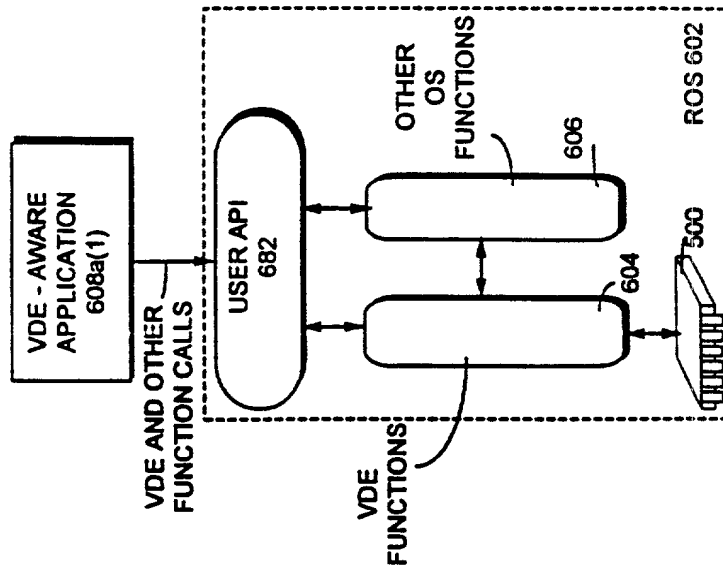


FIG. 11D

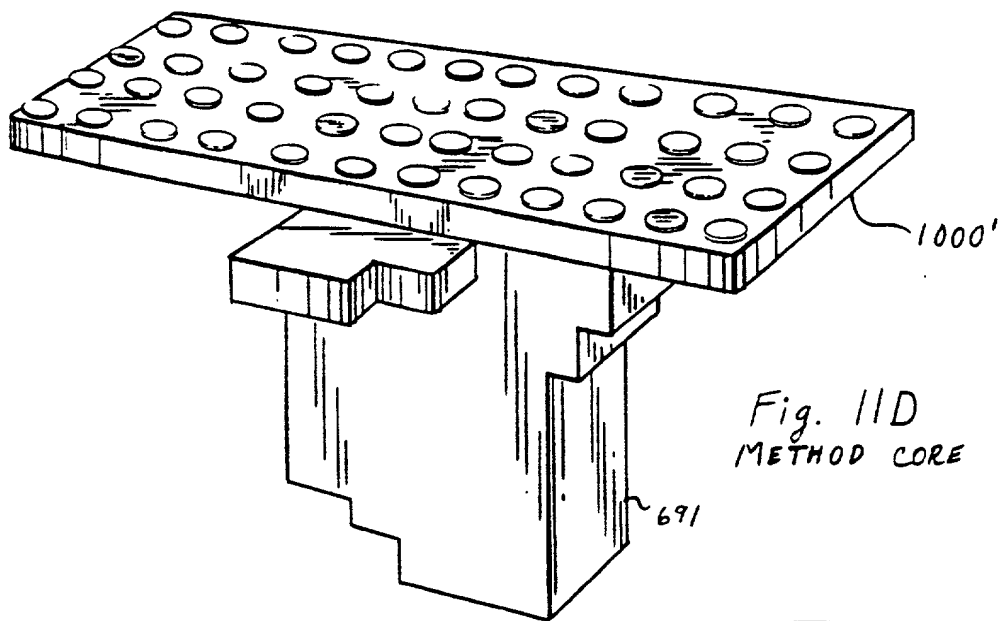


Fig. 11D
METHOD CORE

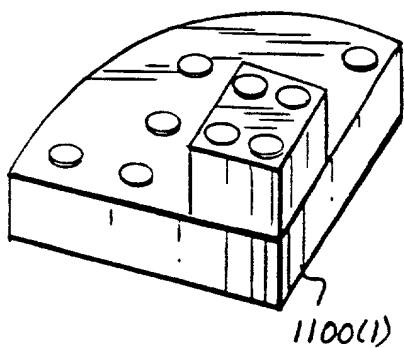


Fig. 11E
LOAD MODULE
WITH DTD

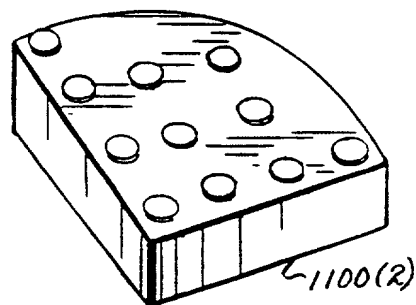


Fig. 11F
LOAD MODULE

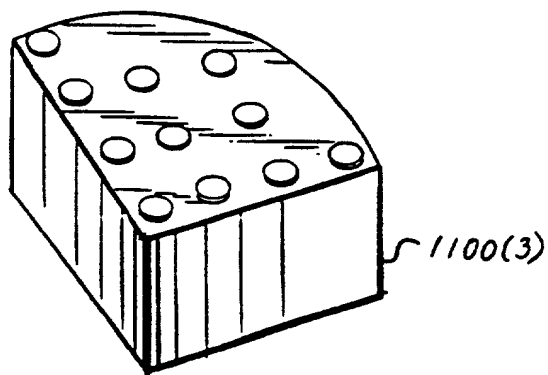


Fig. 11G LOAD MODULE

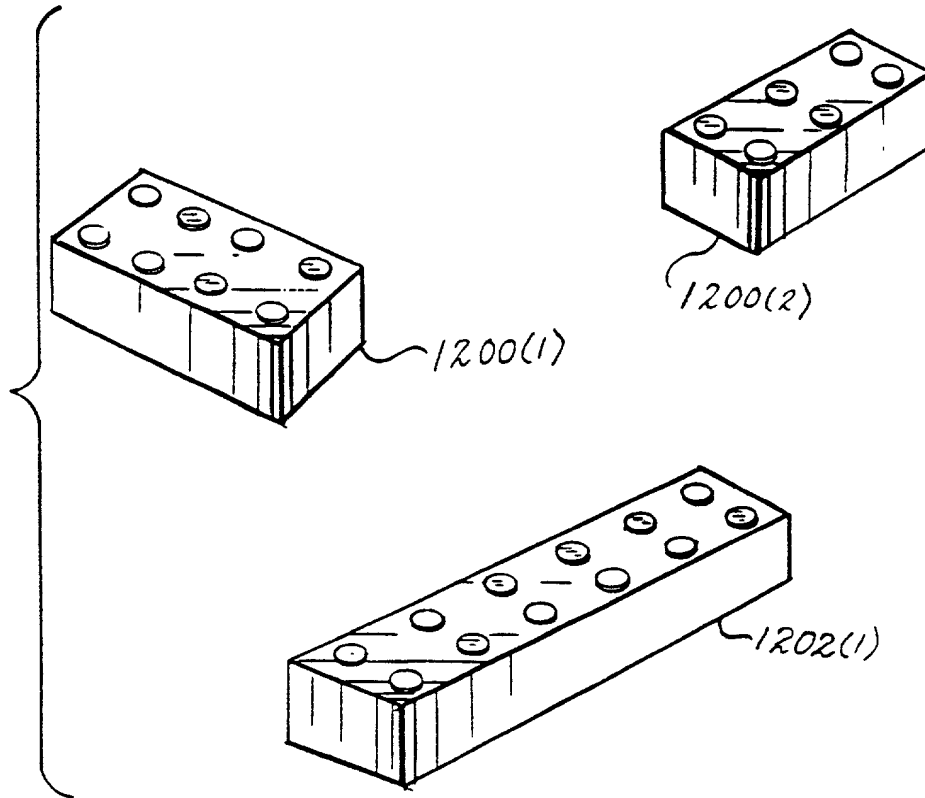
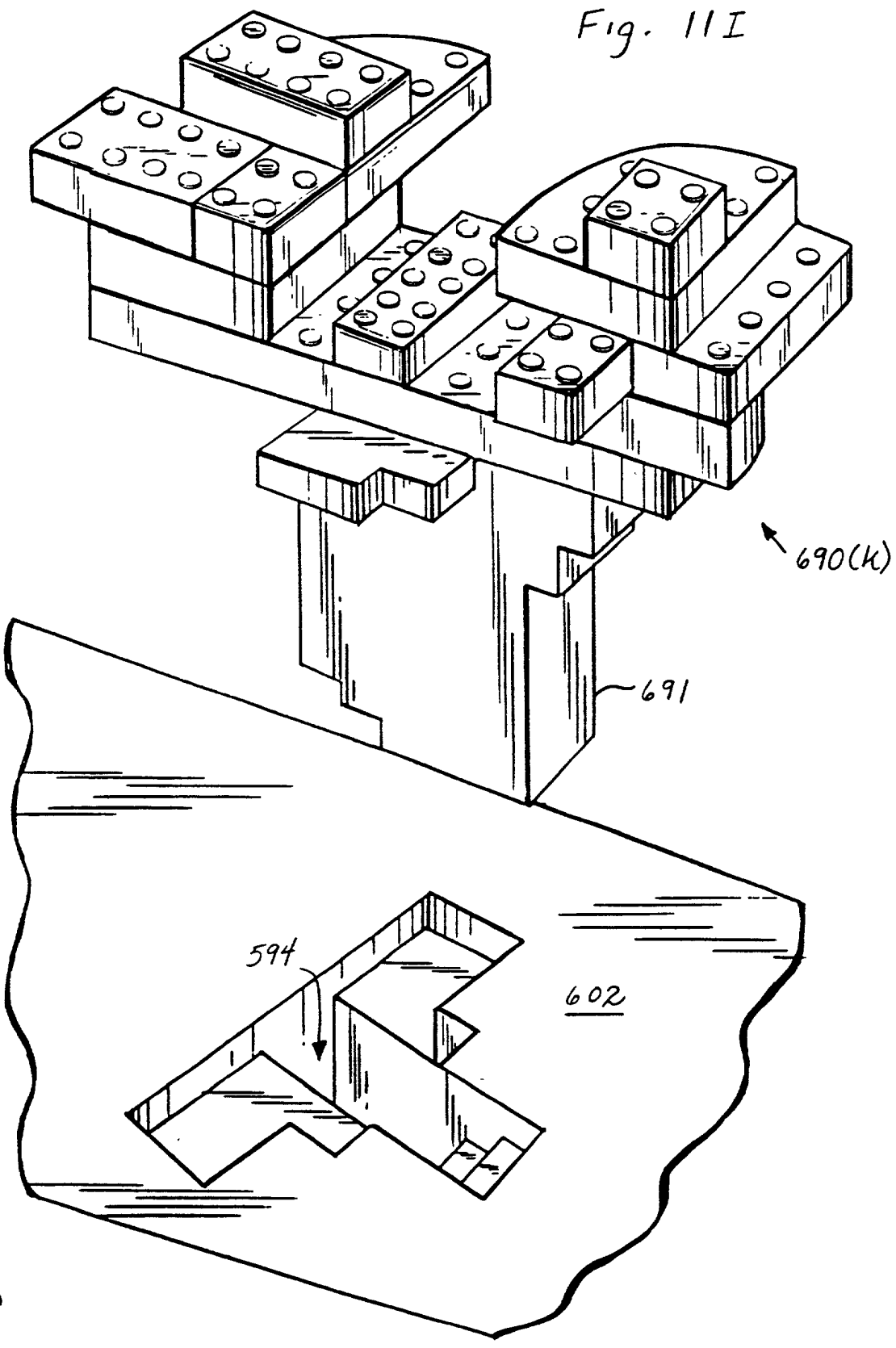
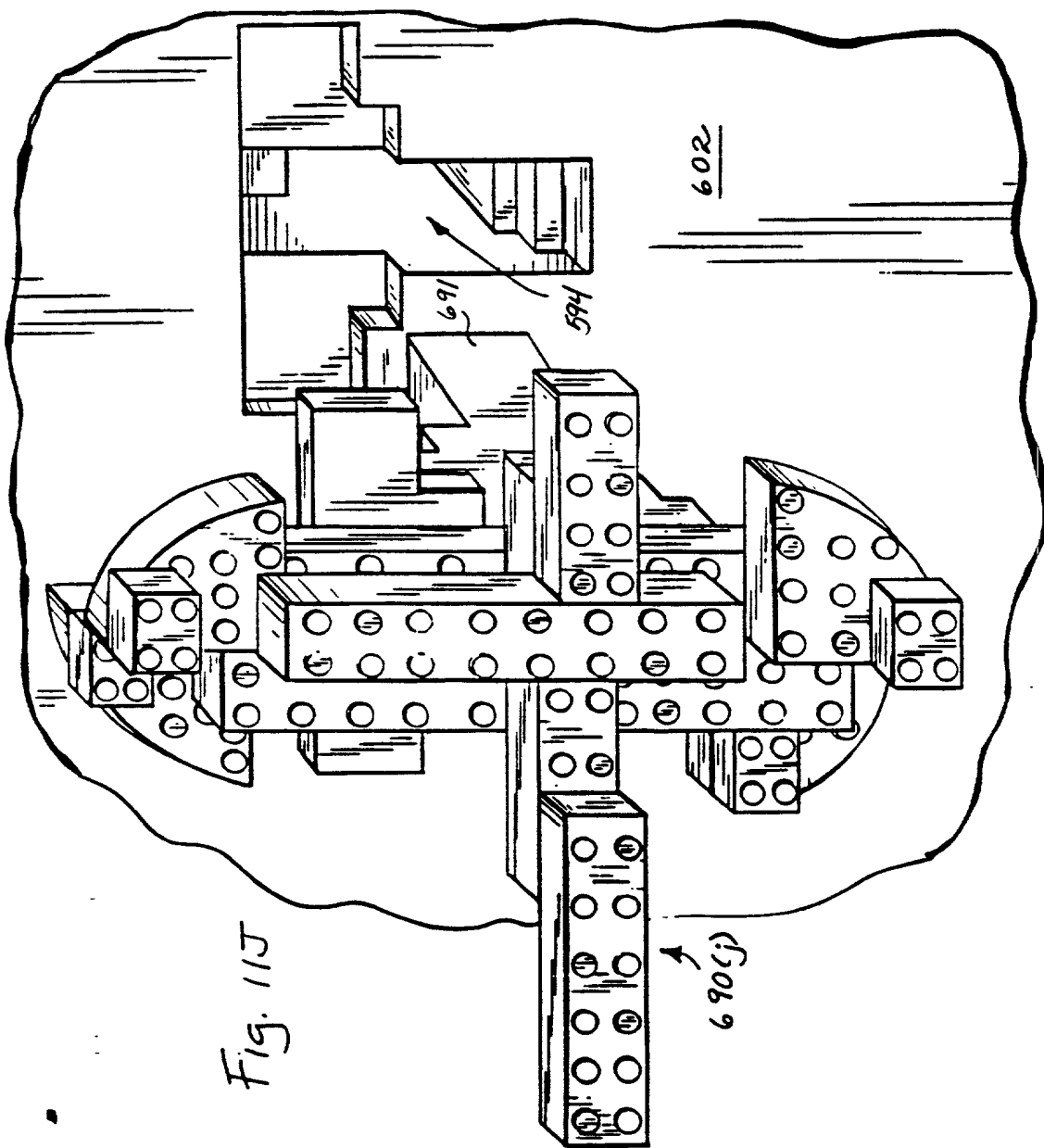


Fig. 11H
DATA STRUCTURES

Fig. 11I

Fig. 11I





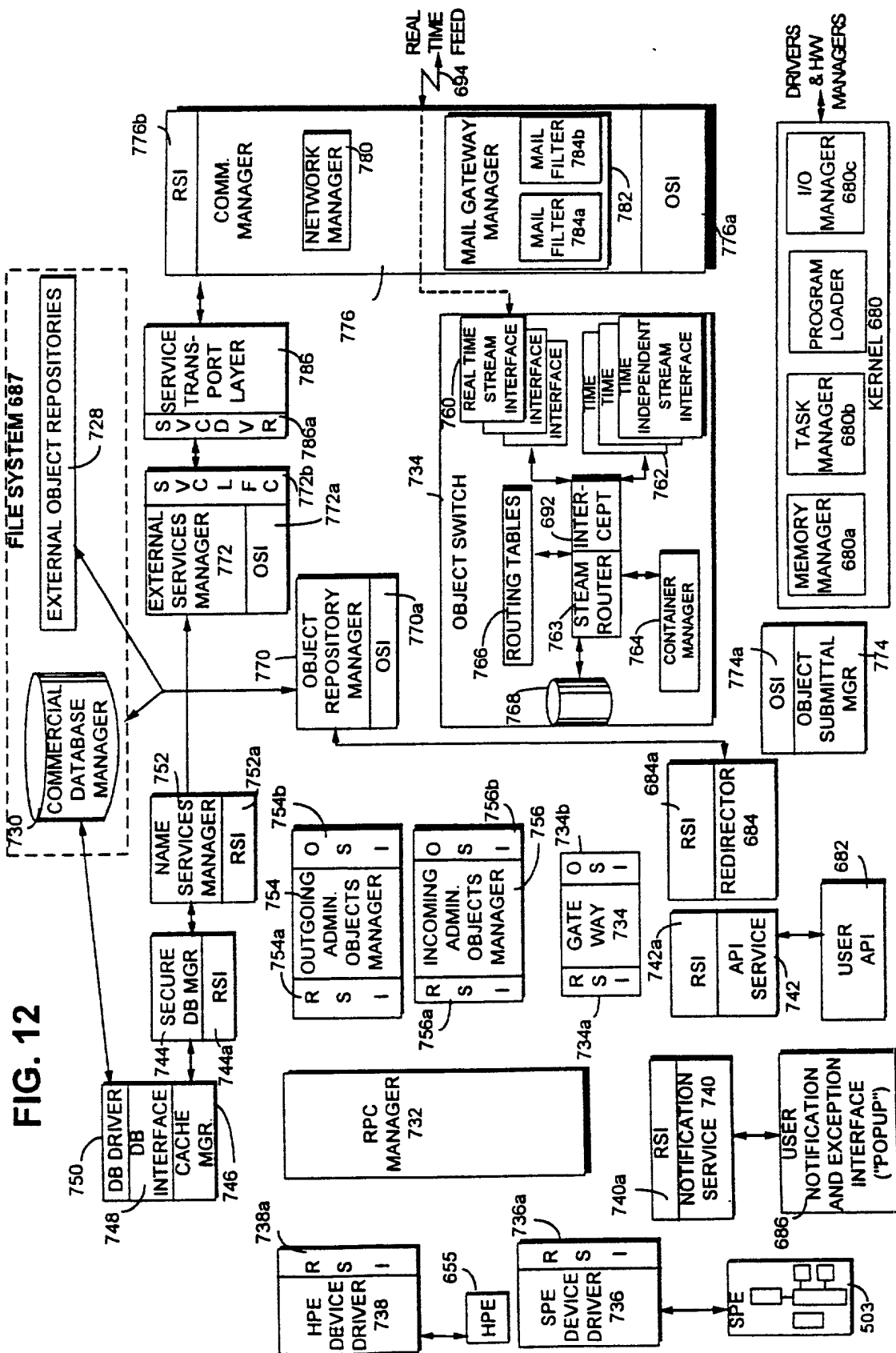
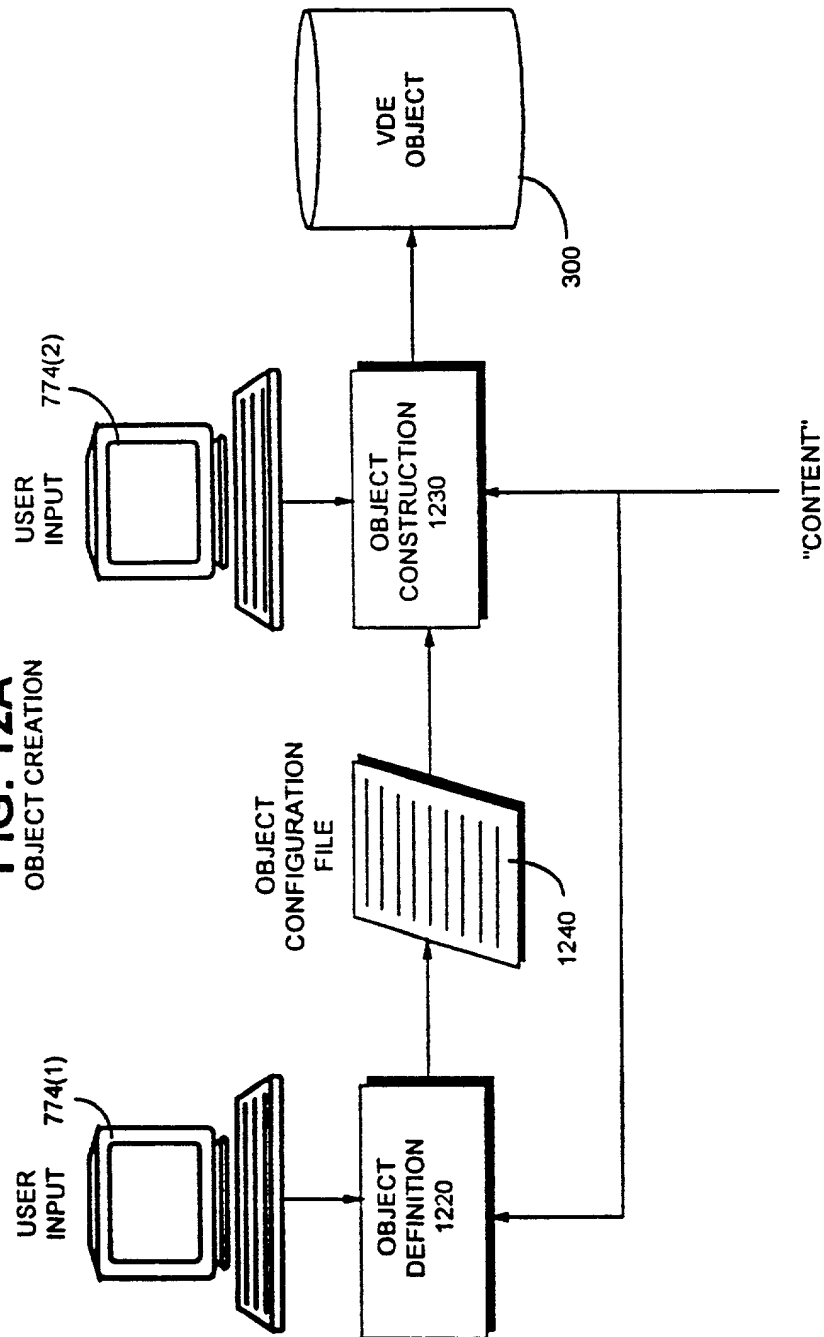
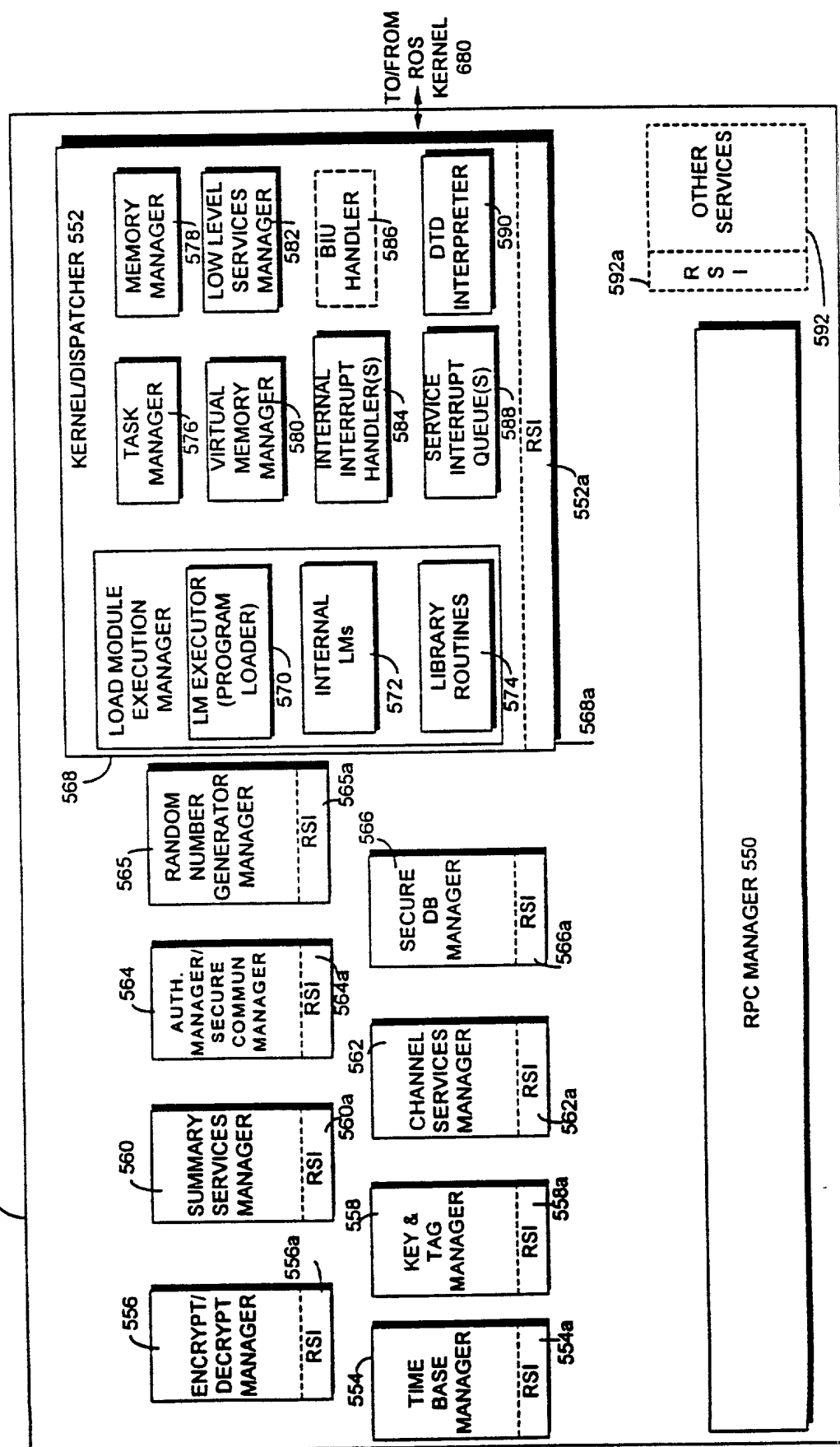
[illegible]

FIG. 12A
OBJECT CREATION



PROTECTED PROCESSING ENVIRONMENT 650



DEVICE FIRM WIRE LOW LEVEL SERVICES 582
INITIALIZATION
POST
DOWNLOAD CHALLENGE/RESPONSE AND AUTHENTICATION
RECOVERY
EEPROM/FLASH MEMORY MANAGER
KERNEL/DISPATCHER 552
INITIALIZATION
TASK MANAGER 576 (SLEEP/AWAKE/CONTEXT SWAP)
INTERRUPT HANDLER 584 (TIMER/BIU/POWER FAIL/WATCHDOG TIMER/ENCRYPTION COMPLETED)
BIU HANDLER 586
MEMORY MANAGER 578
INITIALIZATION (SETTING MMU TABLES
ALLOCATE
DEALLOCATE
VIRTUAL MEMORY MANAGER 580
SWAP BLOCK PAGING
EXTERNAL MODULE PAGING
MEMORY COMPRESS
RPC AND TABLES 550
INITIALIZATION
MESSAGING CODE /SERVICES MANAGER
SEND/RECEIVE
STATUS
RPC DISPATCH TABLE
RPC SERVICE TABLE

•
•
•

FIG. 14A

TIME BASE MANAGER 554
ENCRYPTION/DECRYPTION MANAGER 556
PK
BULK
KEY AND TAG MANAGER 558
KEY STORAGE IN EEPROM
KEY LOCATOR
KEY GENERATOR
CONVOLUTION ALGORITHM
SUMMARY SERVICES MANAGER 560
EVENT SUMMARIES
BUDGET SUMMARIES
DISTRIBUTER SUMMARY SERVICES
CHANNEL SERVICES MANAGER 562
CHANNEL HEADERS
CHANNEL DETAILS
LOAD MODULE EXECUTION SERVICES 568
AUTHENTICATION MANAGER/SECURE COMMUNICATION MANAGER 564
DATABASE MANAGER 566
MANAGEMENT FILE SUPPORT
TRANSACTION AND SEQUENCE NUMBER SUPPORT
SRN/ HASH
DTD INTERPRETER 590
LIBRARY ROUTINES 574
I/O CALLS (STRING SEARCH ETC.)
MISC. ITEMS THAT ARE PROBABLY LIBRARY ROUTINES
TAG CHECKING, MD5, CRC'S
INTERNAL LM'S 572 FOR BASIC METHODS
METER LOAD MODULE(S)
BILLING LOAD MODULE(S)
BUDGET LOAD MODULE(S)
AUDIT LOAD MODULE(S)
READ OBJECT LOAD MODULE(S)
WRITE OBJECT LOAD MODULE(S)
OPEN OBJECT LOAD MODULE(S)
CLOSE OBJECT LOAD MODULE(S)

•
•
•

SPU ROM/EEPROM/FLASH 532

FIG. 14B

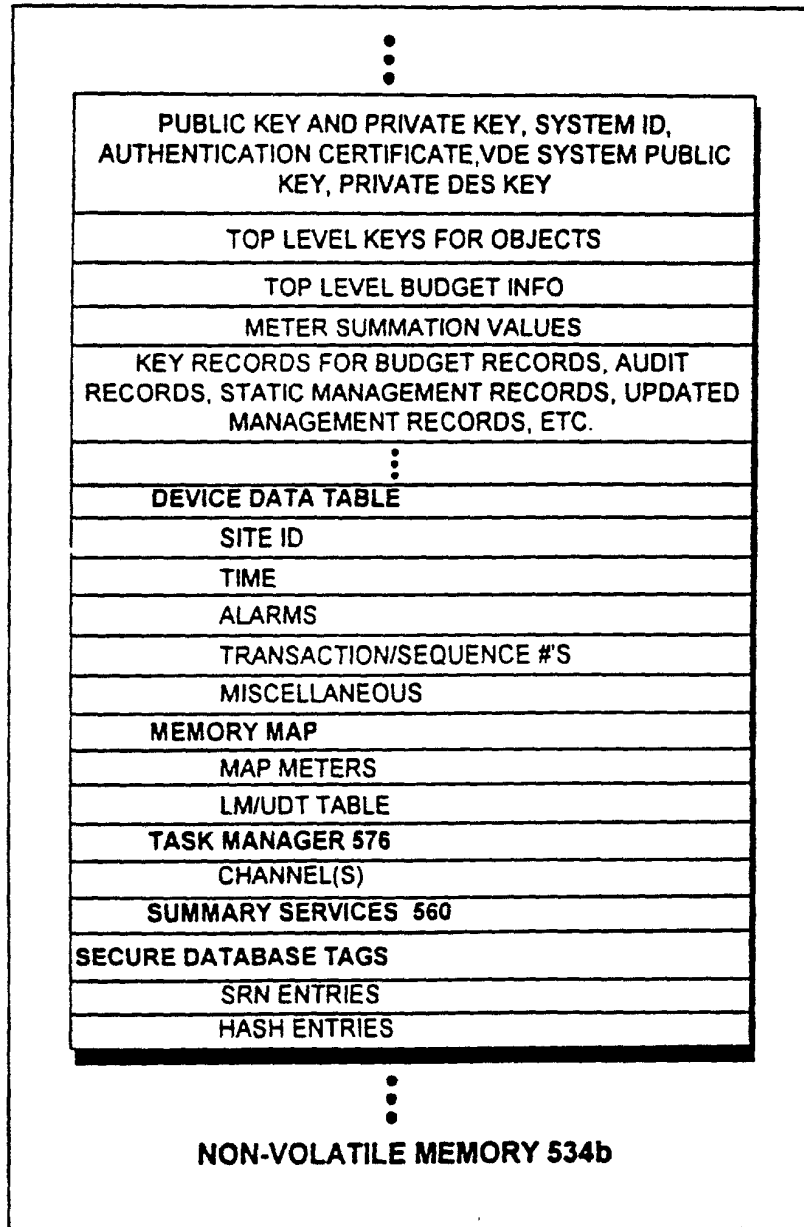
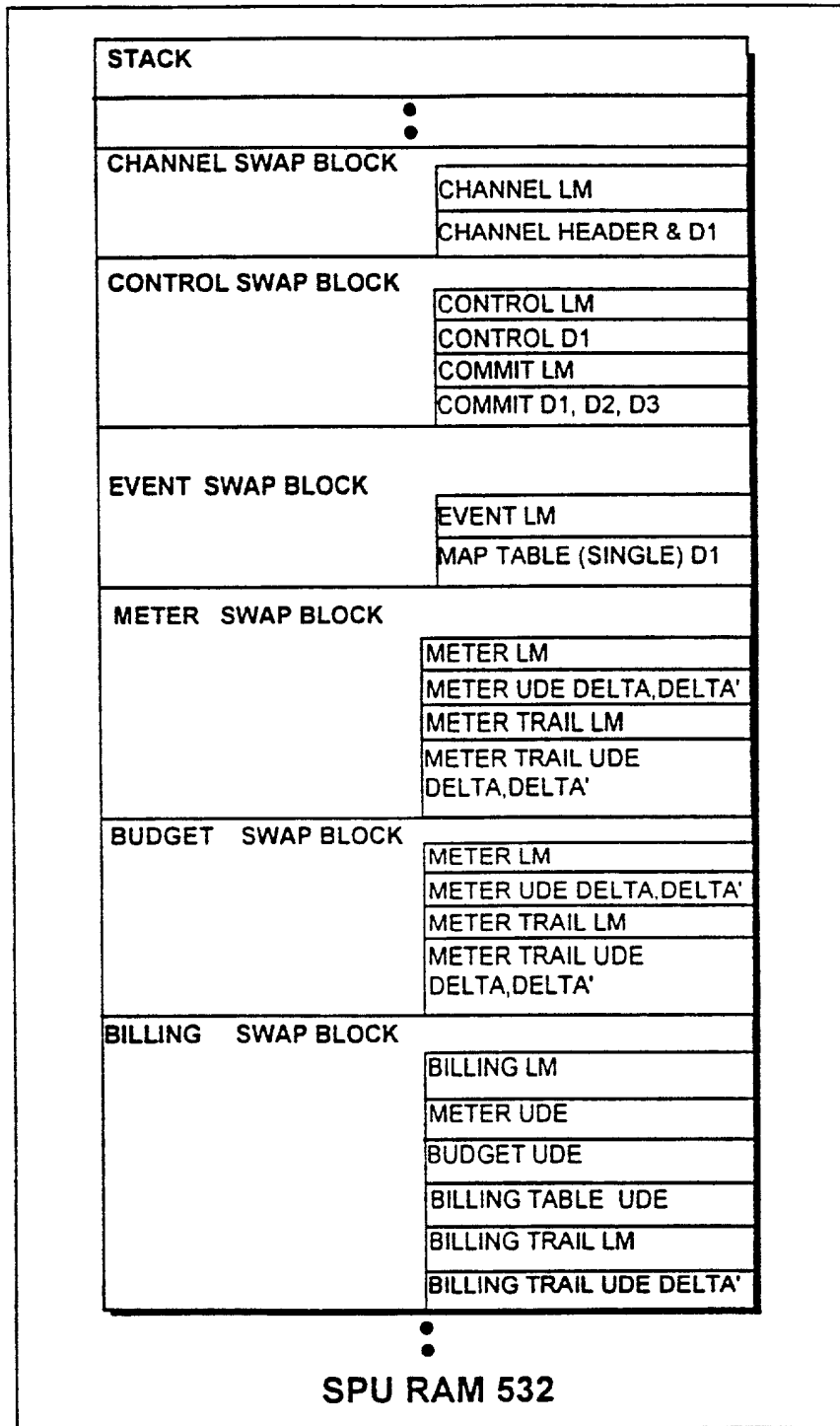


FIG. 14C



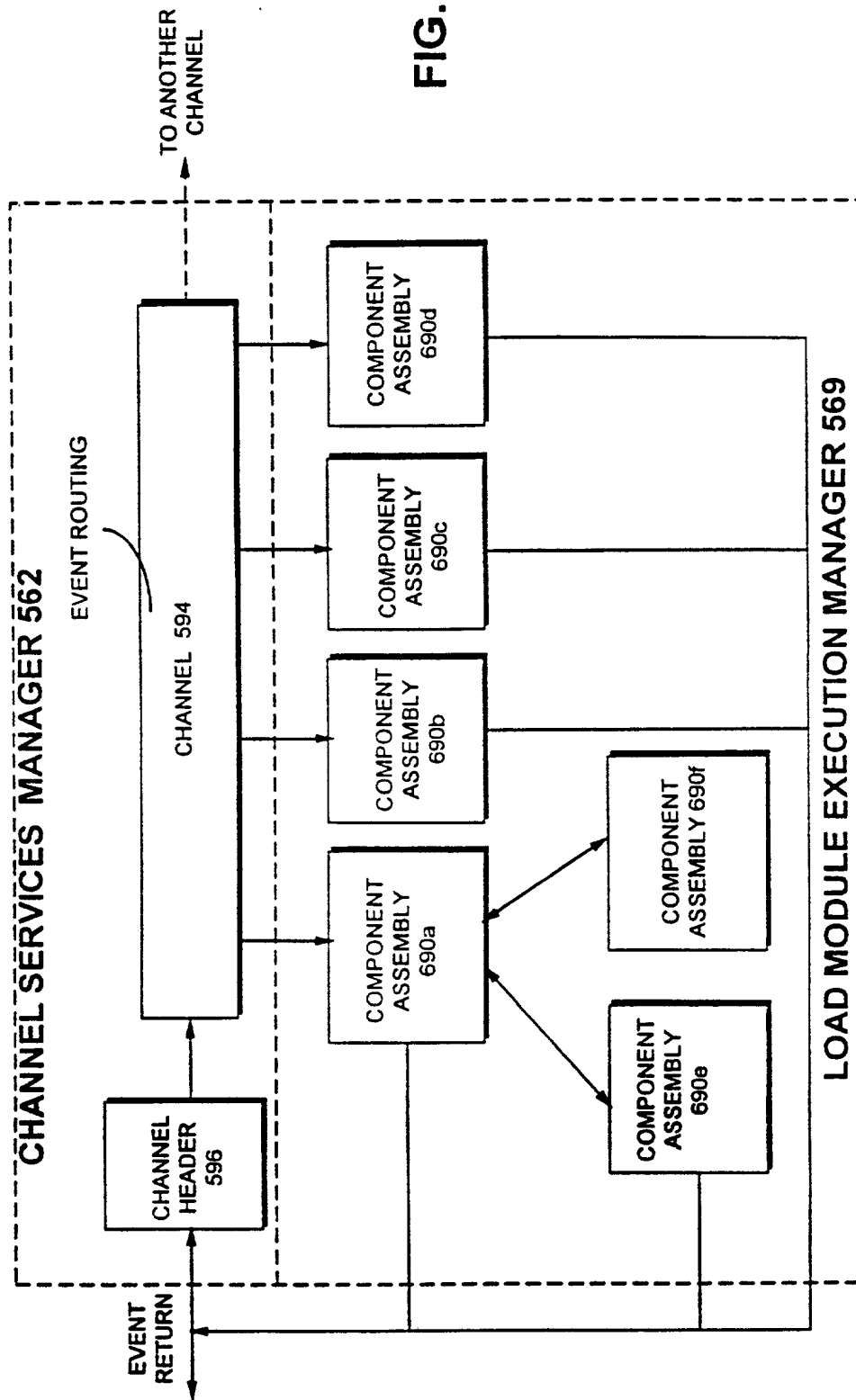


FIG. 15

FIG. 15A

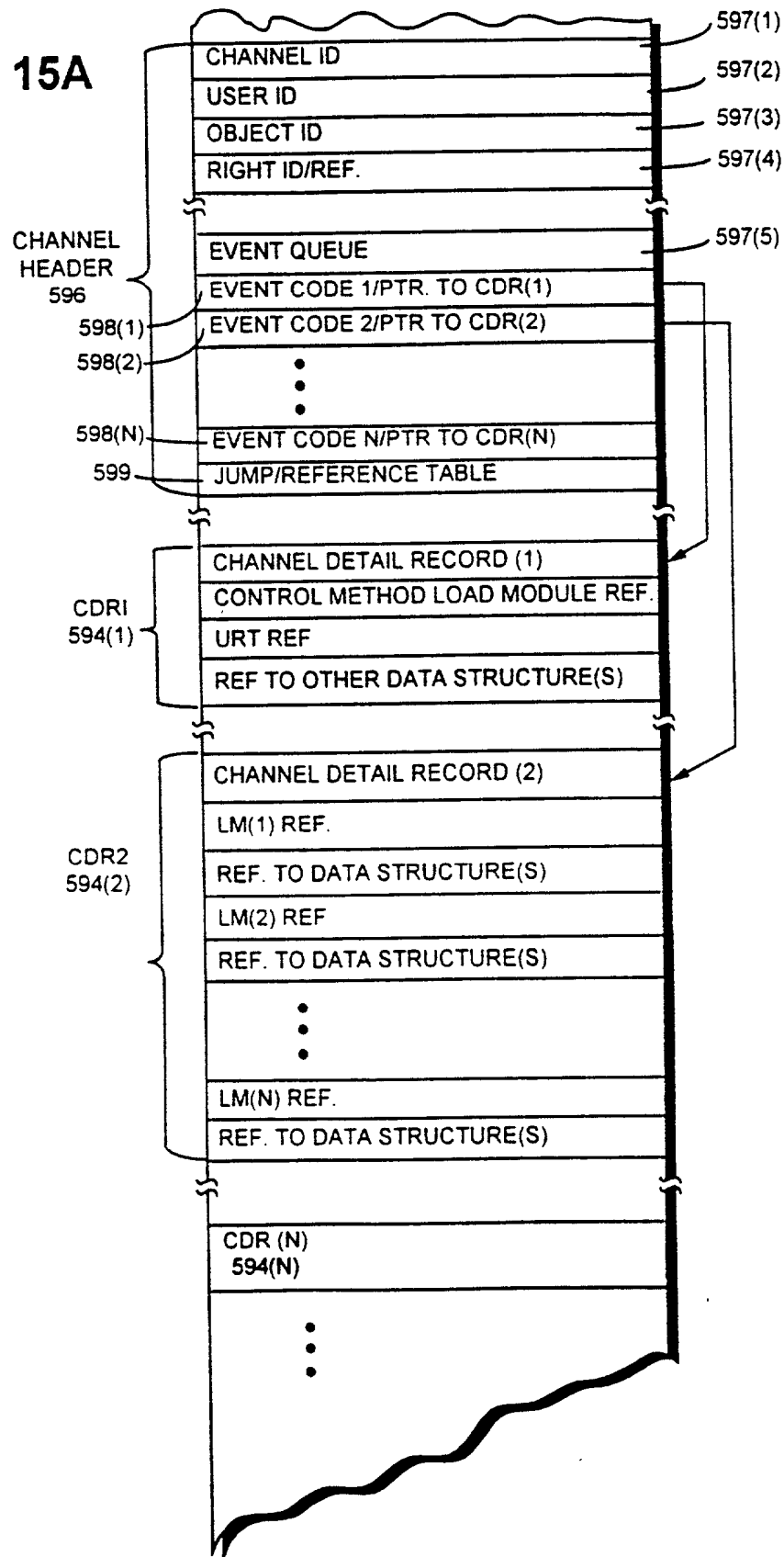


FIG. 15B

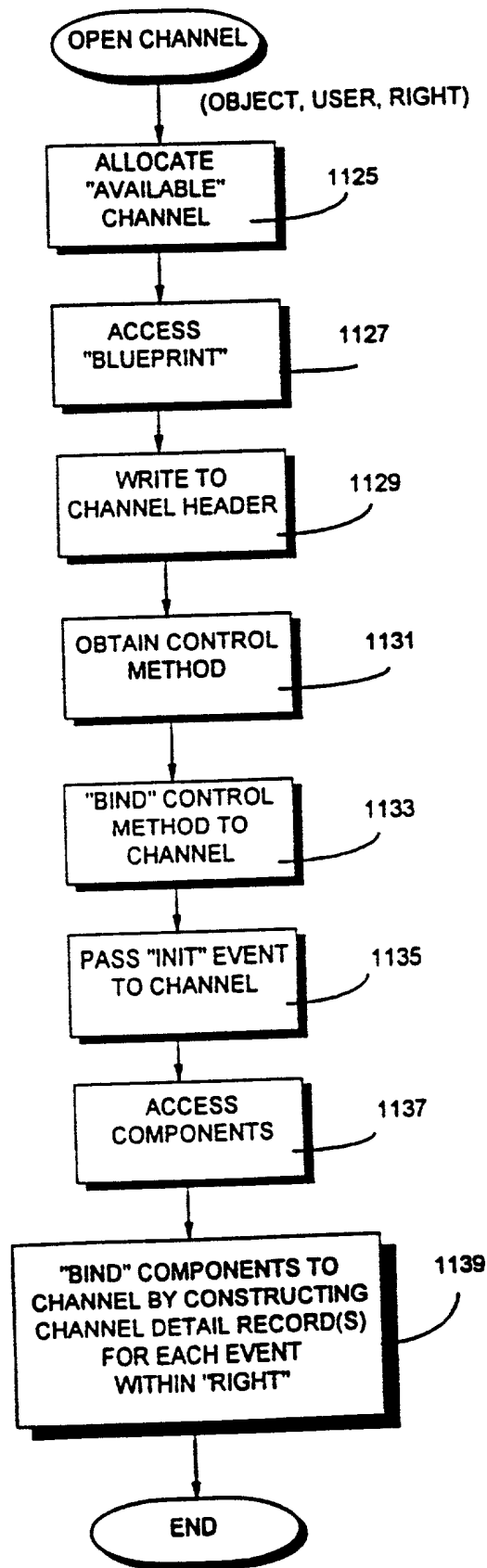
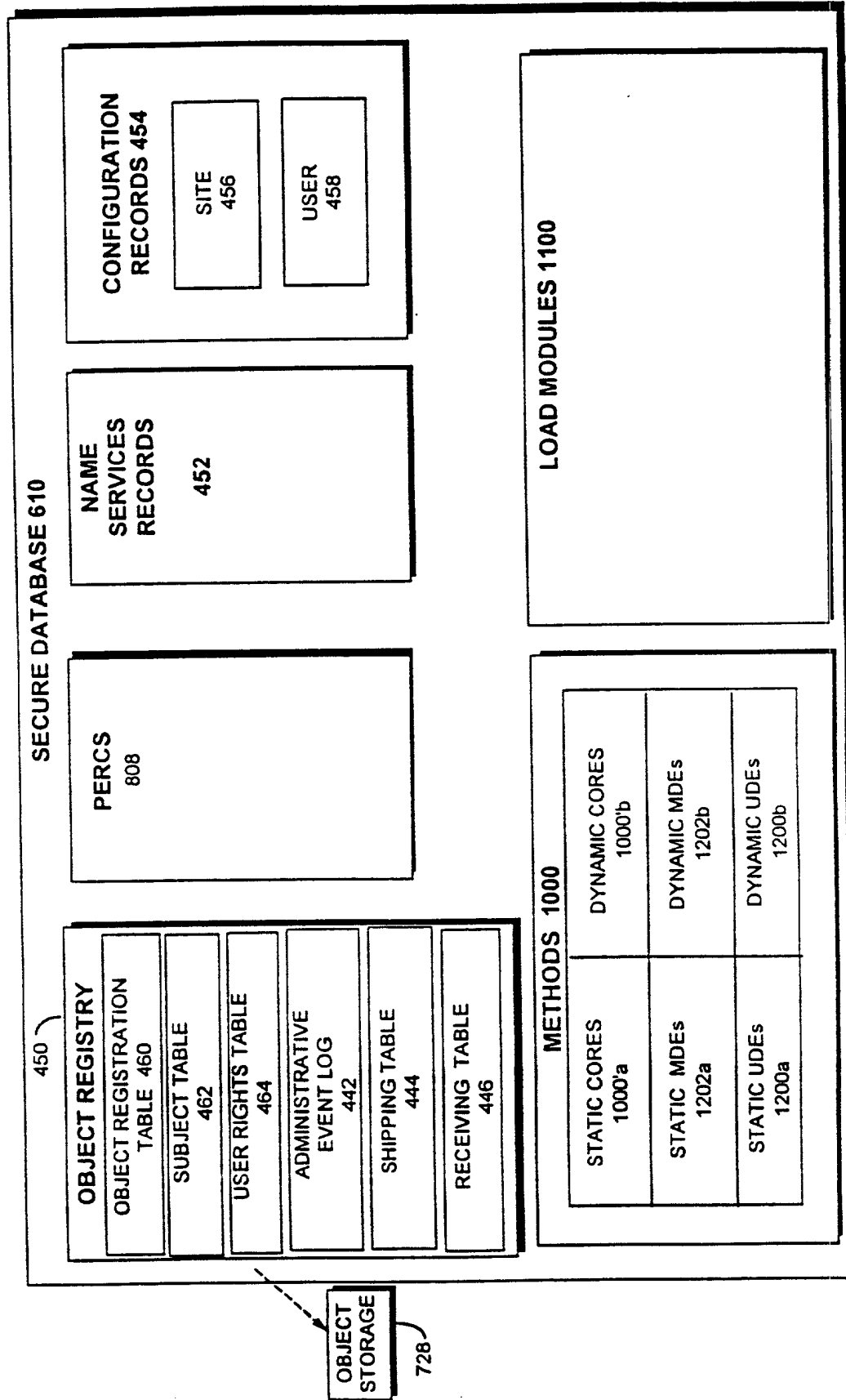
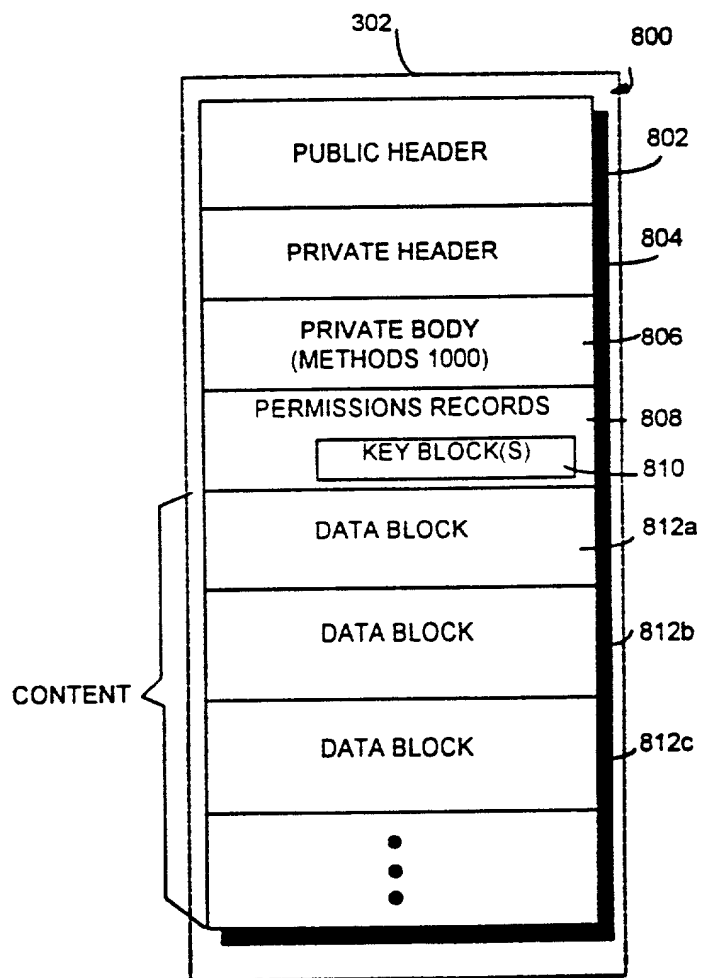


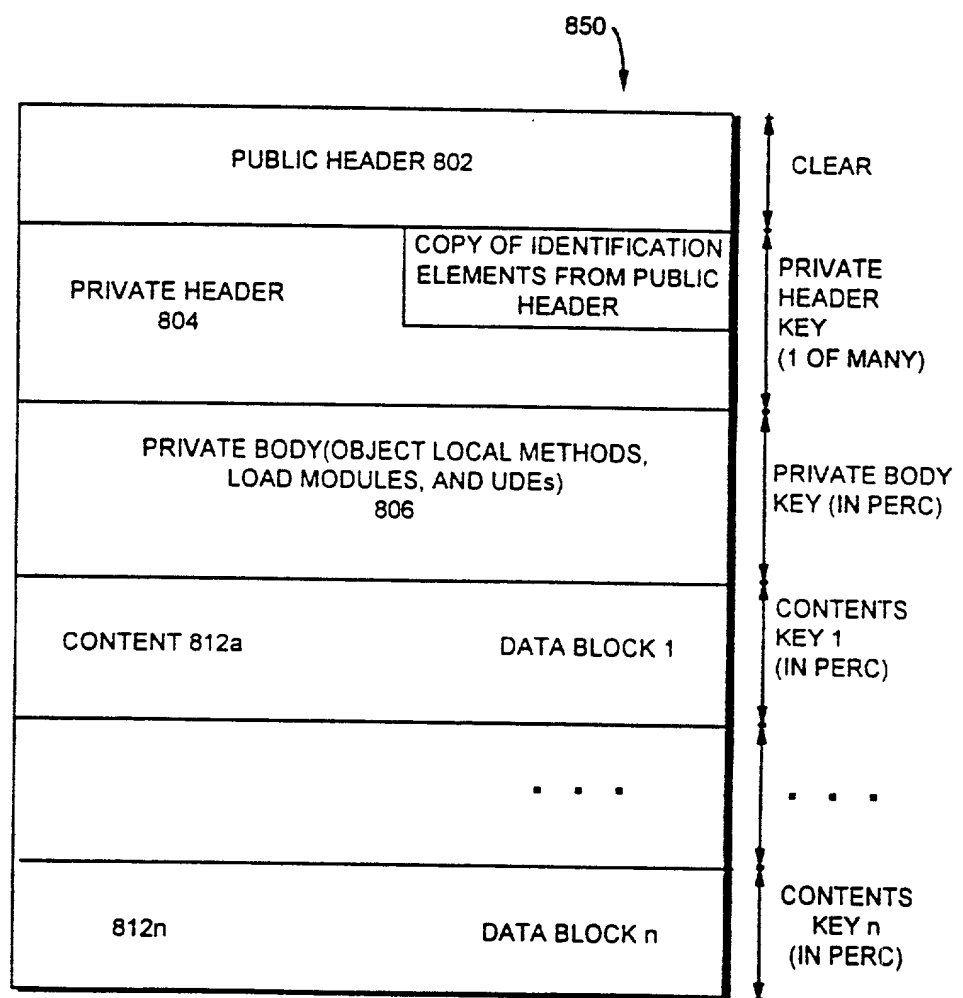
FIG. 16





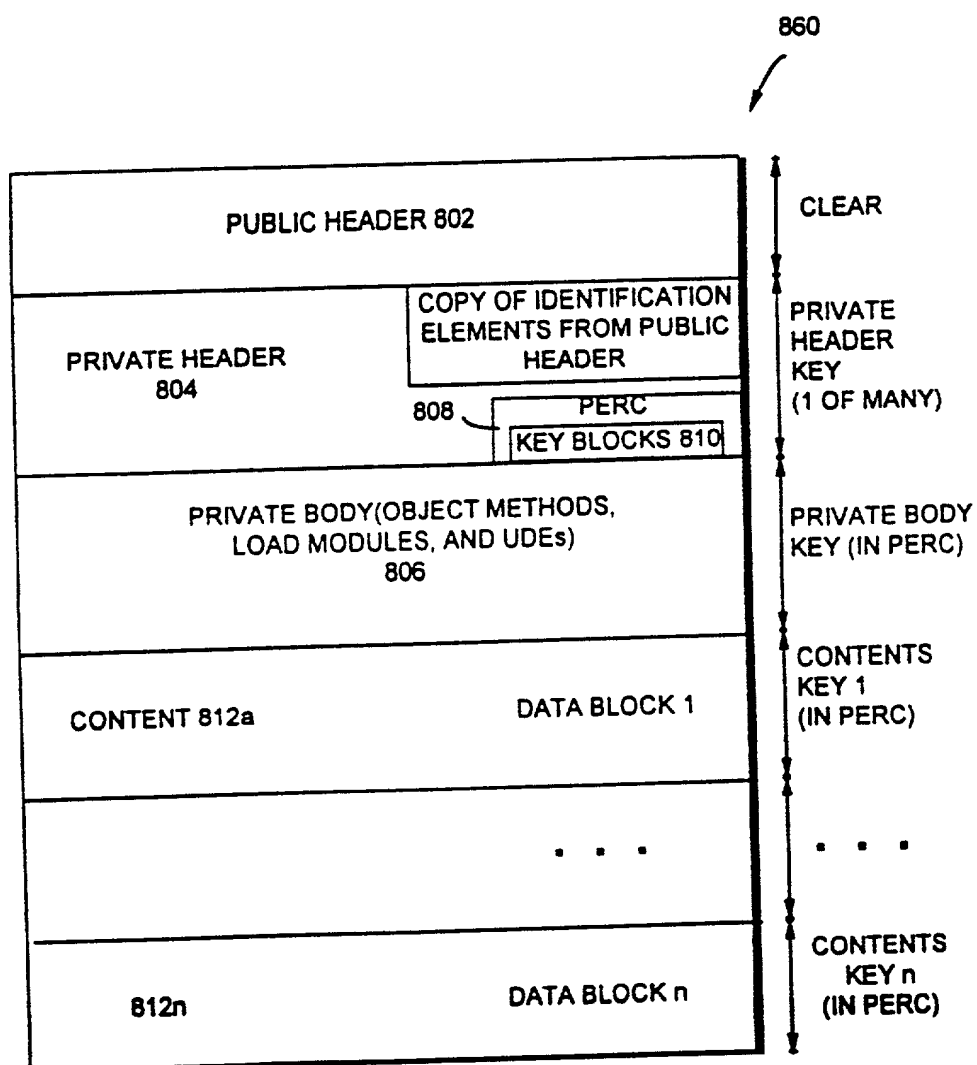
LOGICAL OBJECT

FIG. 17



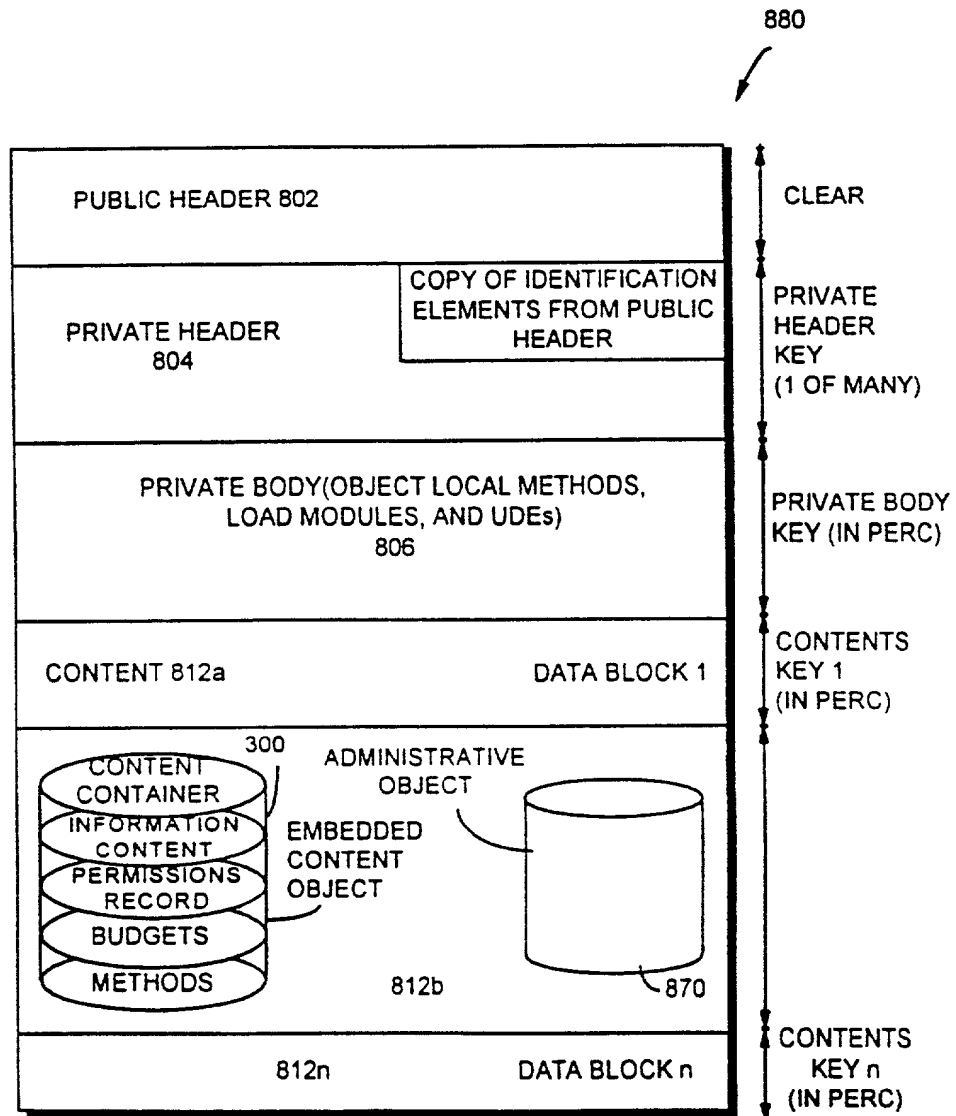
STATIONARY OBJECT

FIG. 18



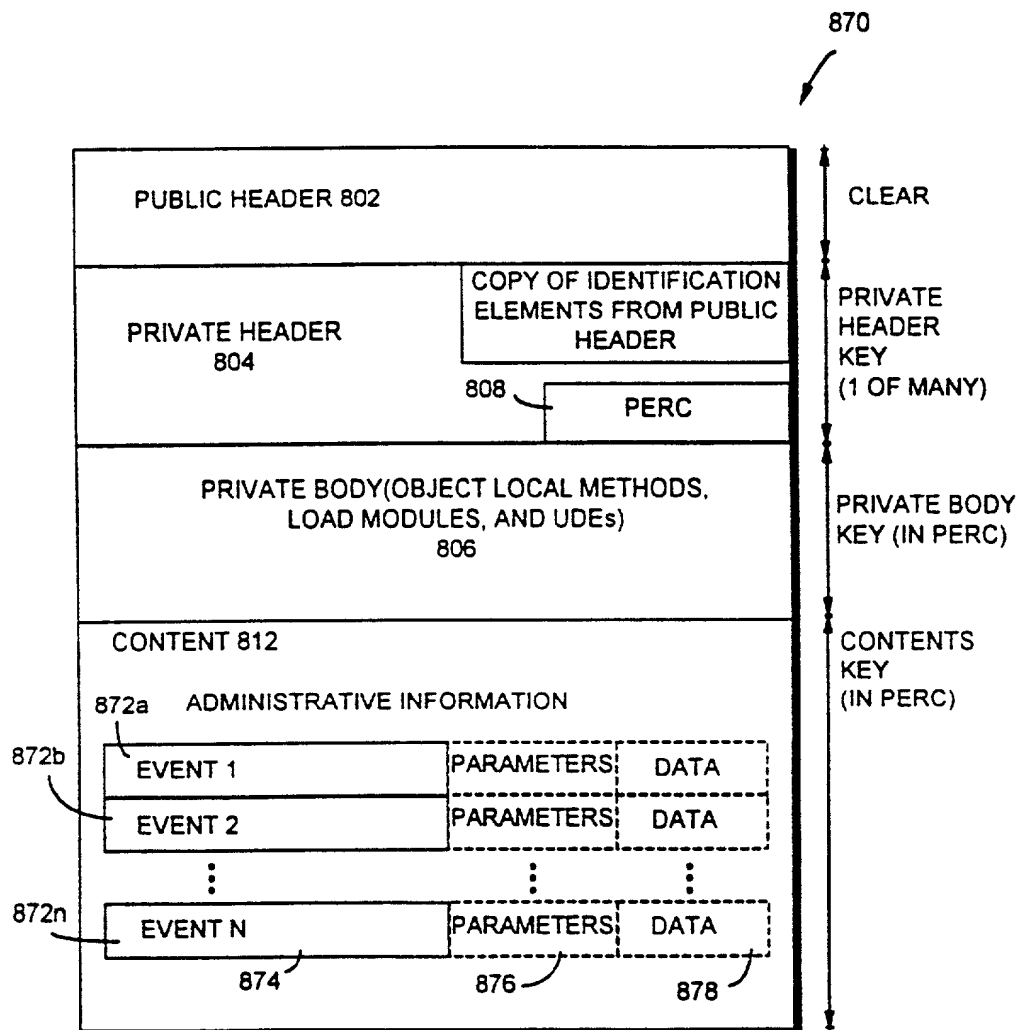
TRAVELING OBJECT

FIG. 19



CONTENT OBJECT

FIG. 20



ADMINISTRATIVE OBJECT

FIG. 21

FIG. 22

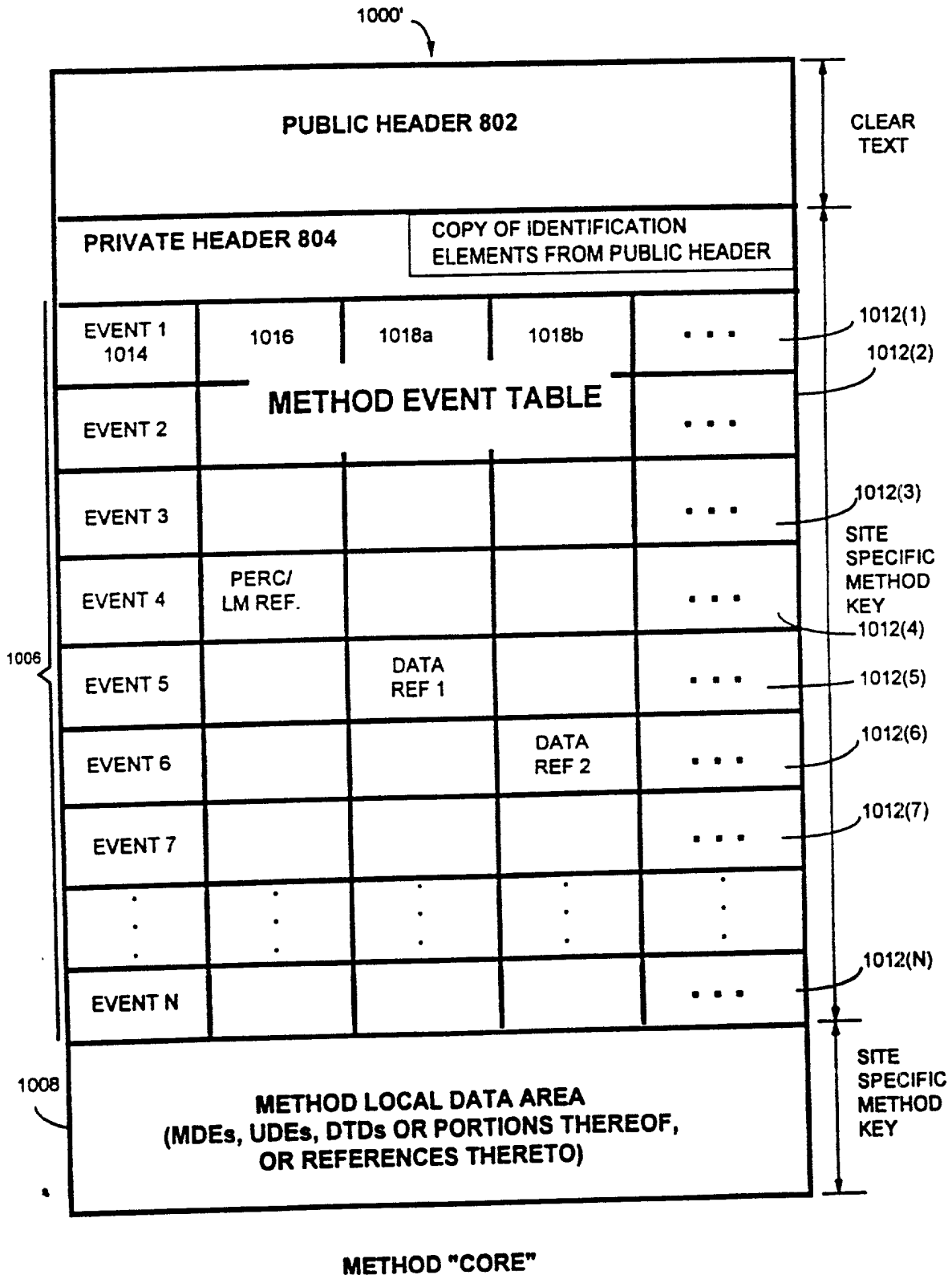
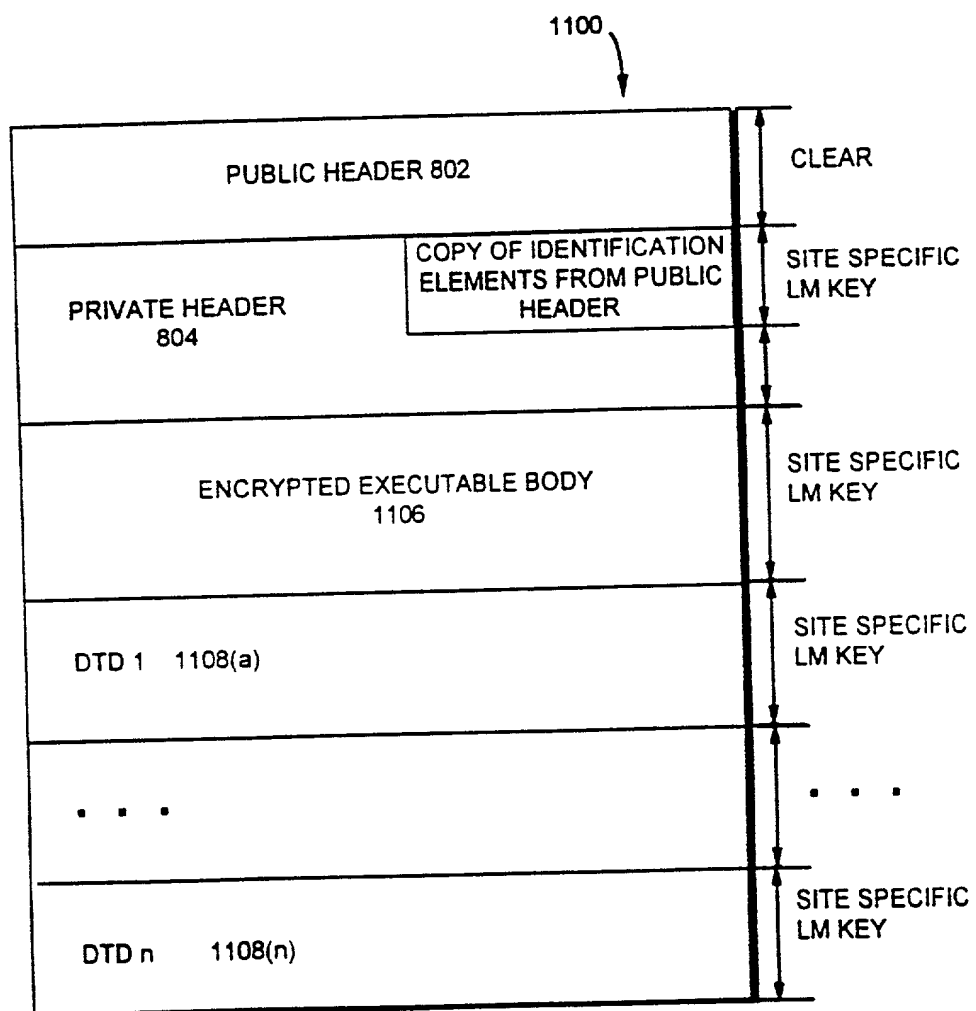
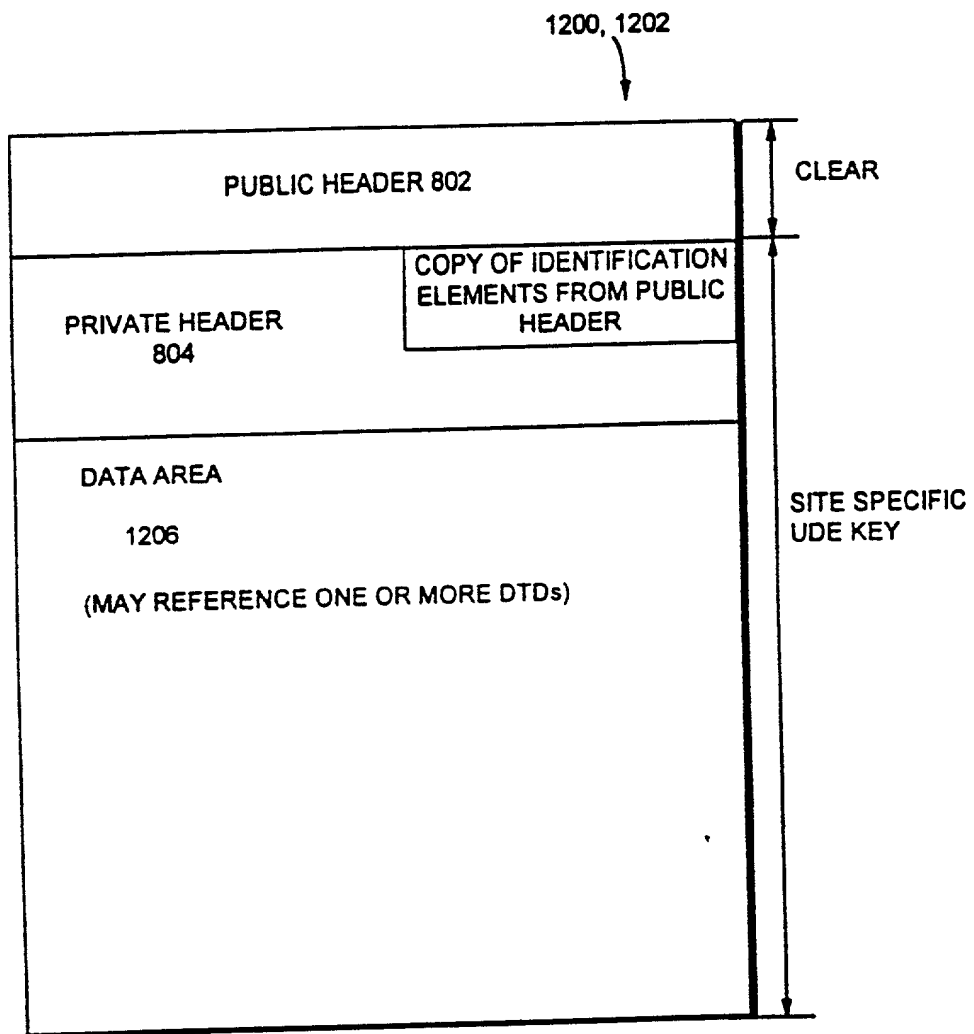


FIG. 23



LOAD MODULE

FIG. 24



UDE (MDE)

FIG. 25A

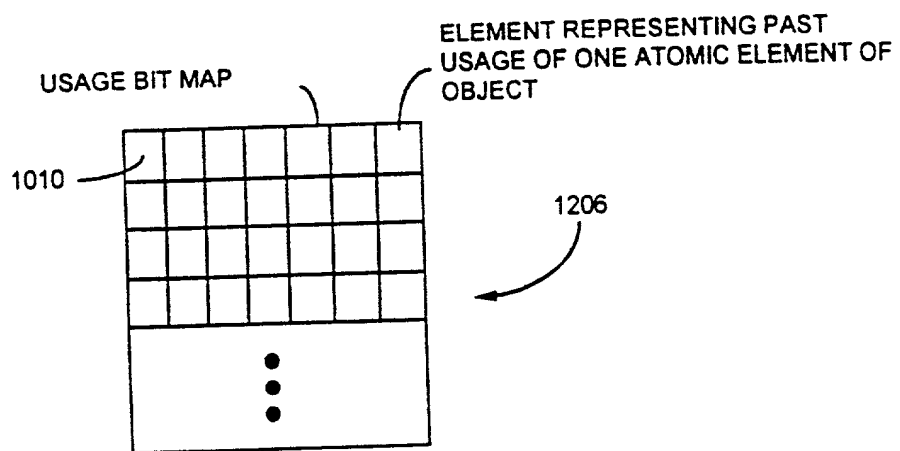


FIG. 25B

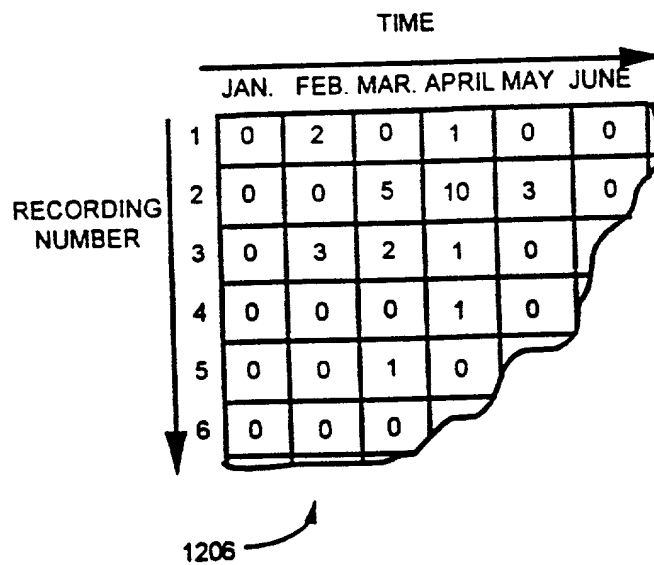


FIG. 25C

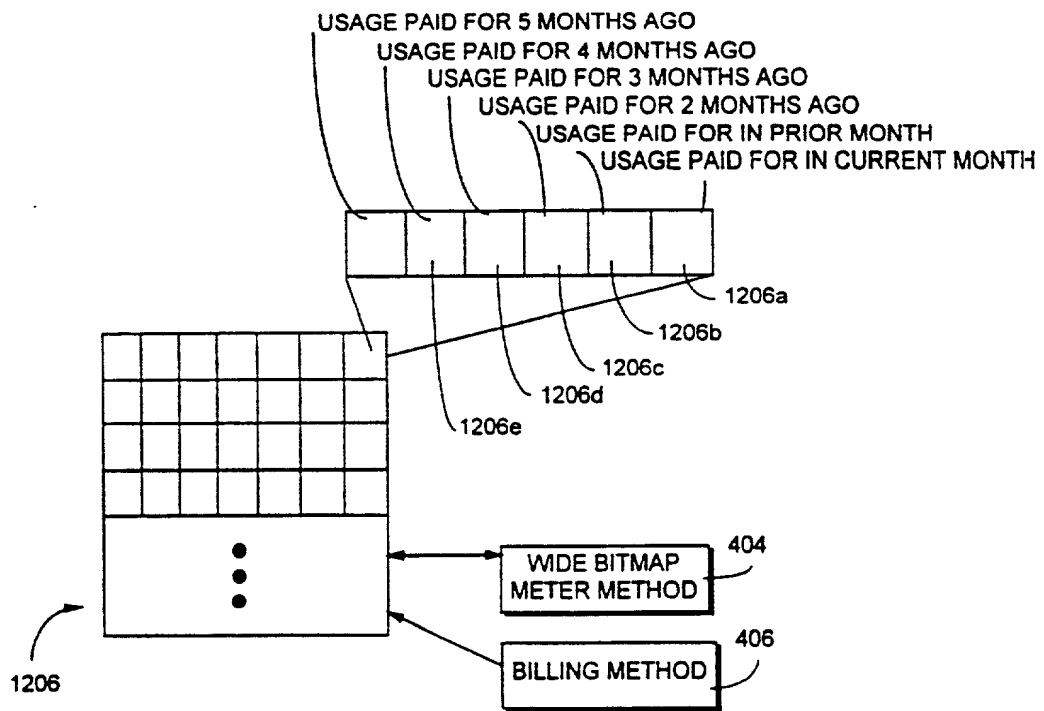


FIG. 25C

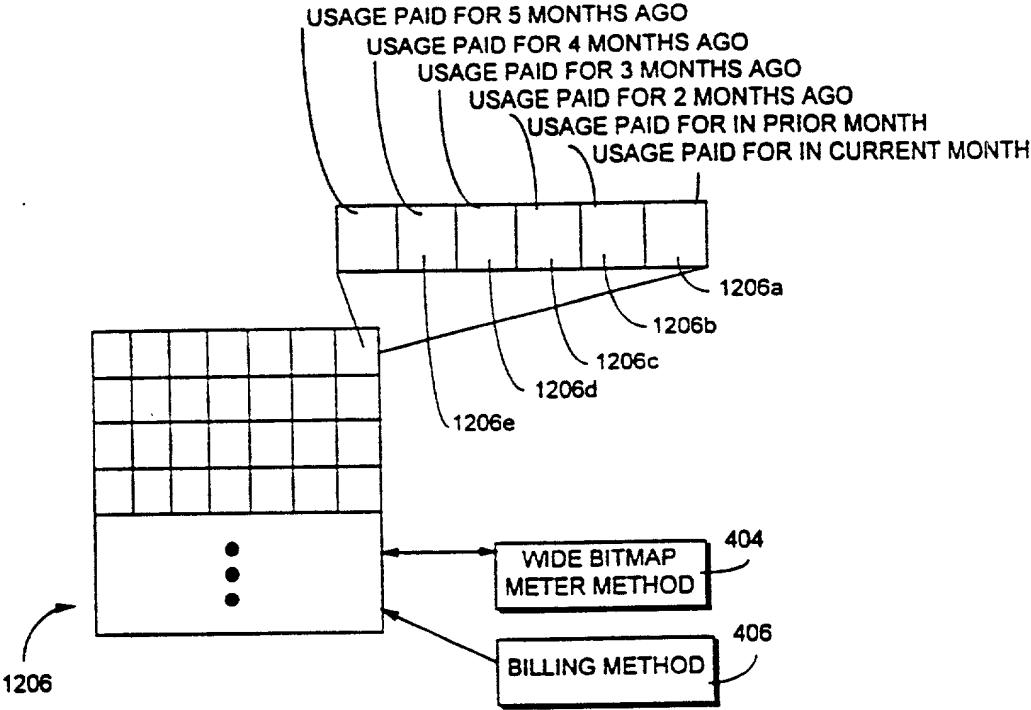


FIG. 26

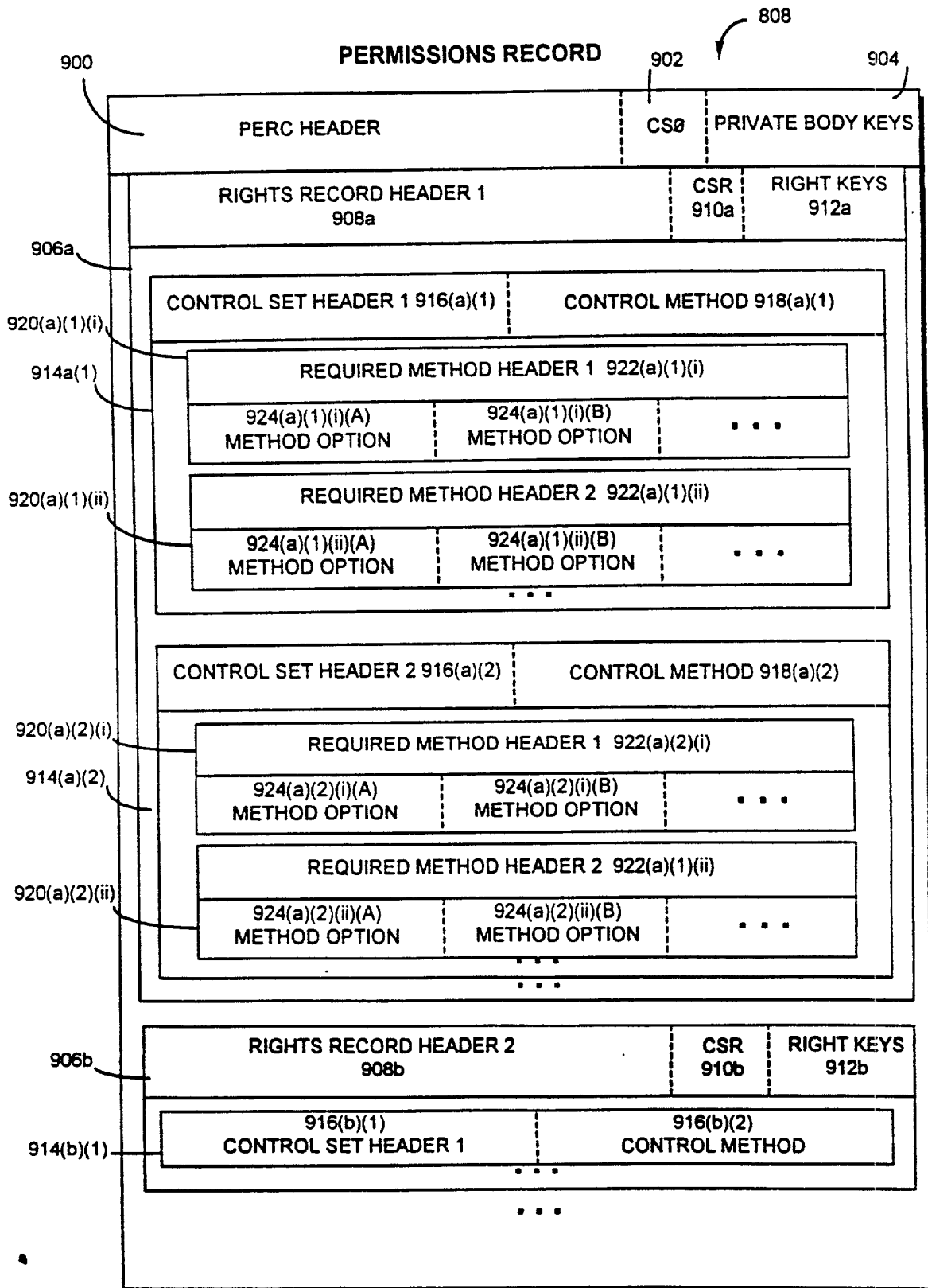
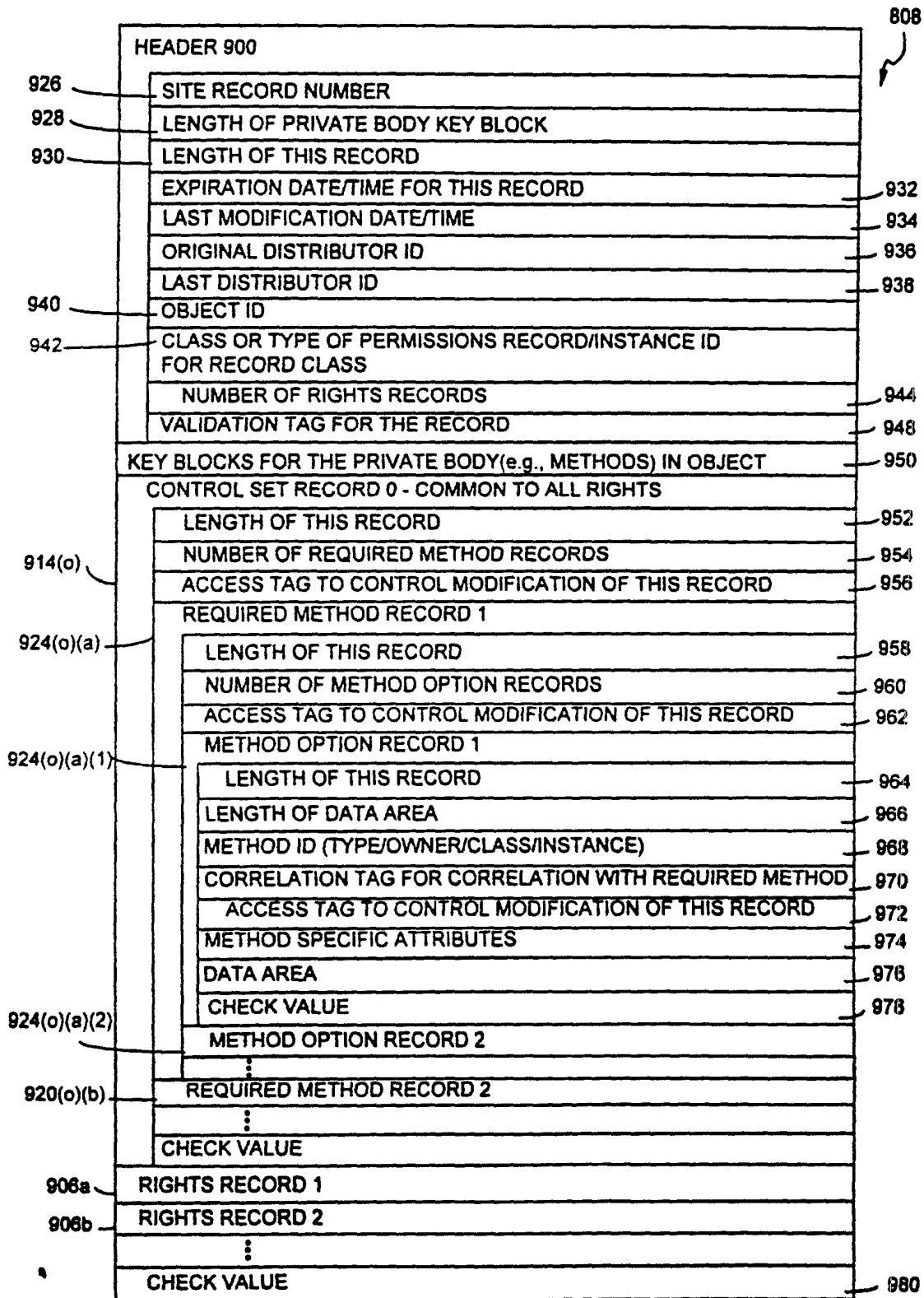


FIG. 26A



PERC

FIG. 26B

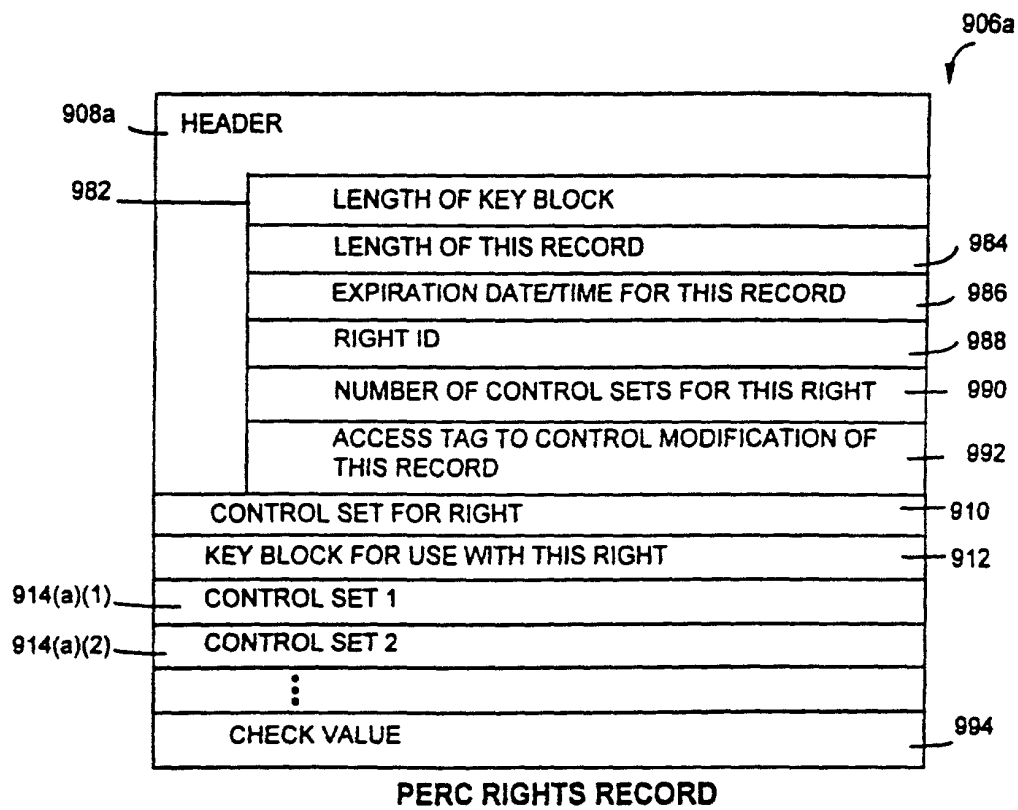


FIG. 27
SHIPPING TABLE

		444A(1)	
HEADER 444A	SITE RECORD NUMBER		444
	USER (GROUP) ID	444A(2)	
	REF. TO "FIRST" COMPLETED OUTGOING SHIPPING RECORD	444A(3)	
	REF. TO "LAST" COMPLETED OUTGOING SHIPPING RECORD	444A(4)	
	REF. TO "FIRST" SCHEDULED OUTGOING SHIPPING RECORD	444A(5)	
	REF. TO "LAST" SCHEDULED OUTGOING SHIPPING RECORD	444A(6)	
	VALIDATION TAG FROM NAME SERVICES RECORD	444A(7)	
	VALIDATION TAG FOR "FIRST" OUTGOING SHIPPING RECORD(S)	444A(8)	
	CHECK VALUE	444A(9)	
SHIPPING RECORD 445(1)	SITE RECORD NUMBER	445(1)(A)	
	FIRST DATE/TIME FOR SCHEDULED SHIPMENT	445(1)(B)	
	LAST DATE/TIME FOR SCHEDULED SHIPMENT	445(1)(C)	
	ACTUAL DATE/TIME OF COMPLETED SHIPMENT	445(1)(D)	
	OBJECT ID OF ADMINISTRATIVE OBJECT (TO BE) SHIPPED	445(1)(E)	
	REF. TO ENTRY IN ADMINISTRATIVE EVENT LOG	445(1)(F)	
	REF. TO NAME SERVICES RECORD NAMING RECIPIENT	445(1)(G)	
	PURPOSE OF SHIPMENT	445(1)(H)	
	STATUS OF SHIPMENT	445(1)(I)	
	REF. TO "PREVIOUS" OUTGOING SHIPPING RECORD	445(1)(J)	
	REF. TO "NEXT" OUTGOING SHIPPING RECORD	445(1)(K)	
	VALIDATION TAG FROM HEADER	445(1)(L)	
	VALIDATION TAG TO ADMINISTRATIVE EVENT LOG	445(1)(M)	
	VALIDATION TAG TO NAME SERVICES RECORD	445(1)(N)	
	VALIDATION TAG FROM PREVIOUS RECORD	445(1)(O)	
	VALIDATION TAG TO NEXT RECORD	445(1)(P)	
	CHECK VALUE	445(1)(Q)	
	⋮		
	SHIPPING RECORD N	445(1)(R)	

FIG. 28
RECEIVING TABLE

		446A(1)	
HEADER 446A	SITE RECORD NUMBER		446
	USER (GROUP) ID		446A(2)
	REF. TO "FIRST" COMPLETED INCOMING RECEIVING RECORD		446A(3)
	REF. TO "LAST" COMPLETED INCOMING RECEIVING RECORD		446A(4)
	REF. TO "FIRST" SCHEDULED INCOMING RECEIVING RECORD		446A(5)
	REF. TO "LAST" SCHEDULED INCOMING RECEIVING RECORD		446A(6)
	VALIDATION TAG FROM NAME SERVICES RECORD		446A(7)
	VALIDATION TAG FOR "FIRST" INCOMING RECEIVING RECORD(S)		446A(8)
	CHECK VALUE		446A(9)
RECEIVING RECORD 447(1)	SITE RECORD NUMBER		447(1)(A)
	FIRST DATE/TIME FOR SCHEDULED RECEPTION		447(1)(B)
	LAST DATE/TIME FOR SCHEDULED RECEPTION		447(1)(C)
	ACTUAL DATE/TIME OF COMPLETED RECEPTION		447(1)(D)
	OBJECT ID OF ADMINISTRATIVE OBJECT (TO BE) RECEIVED		447(1)(E)
	REF. TO ENTRY IN ADMINISTRATIVE EVENT LOG		447(1)(F)
	REF. TO NAME SERVICES RECORD NAMING SENDER		447(1)(G)
	PURPOSE OF RECEPTION		447(1)(H)
	STATUS OF RECEPTION		447(1)(I)
	REF. TO "PREVIOUS" INCOMING RECEIVING RECORD		447(1)(J)
	REF. TO "NEXT" INCOMING RECEIVING RECORD		447(1)(K)
	VALIDATION TAGS		447(1)(L)
	CHECK VALUE		447(1)(M)
	⋮		
	RECEIVING RECORD N		447(2)

FIG. 29
ADMINISTRATIVE EVENT LOG

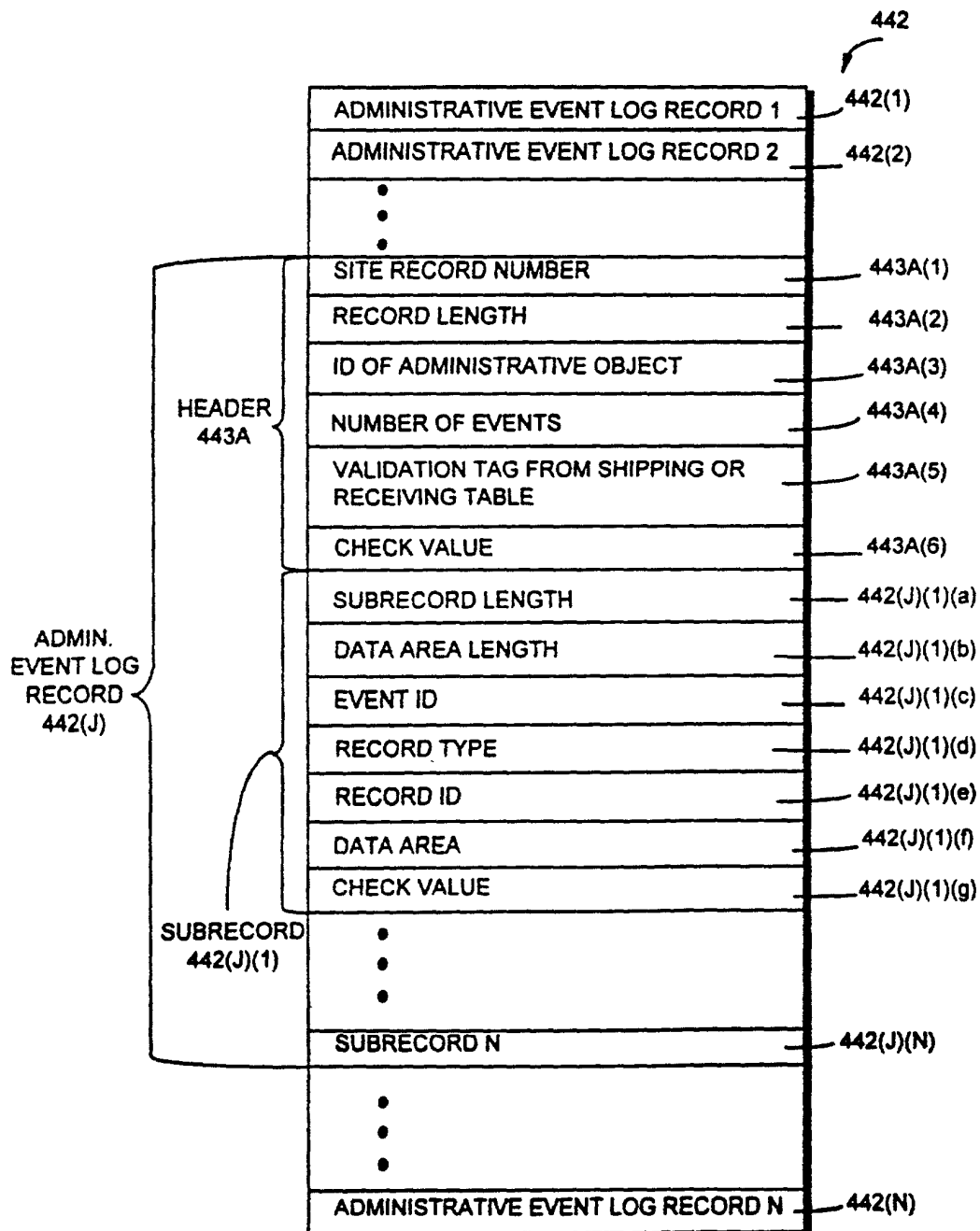
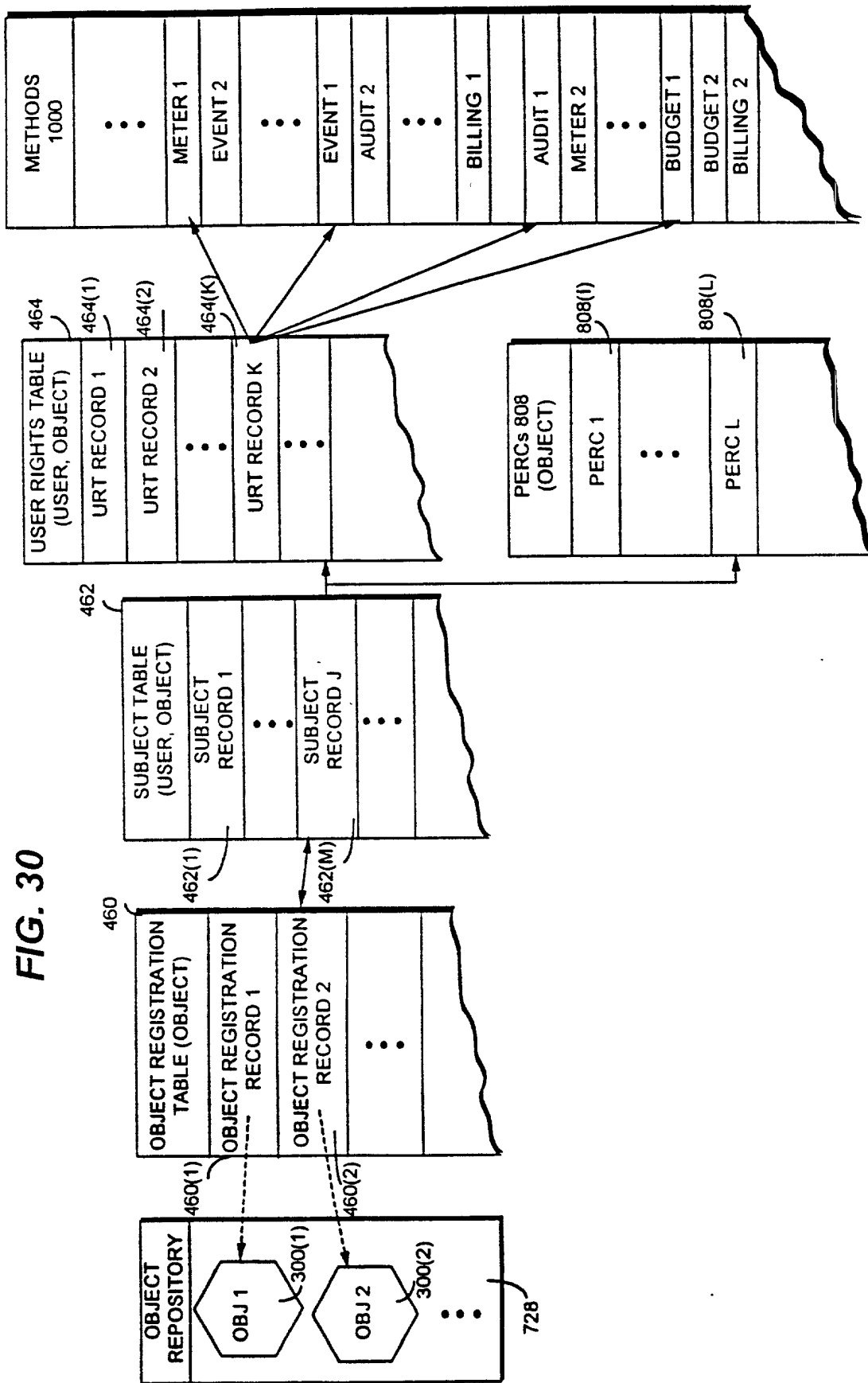


FIG. 30



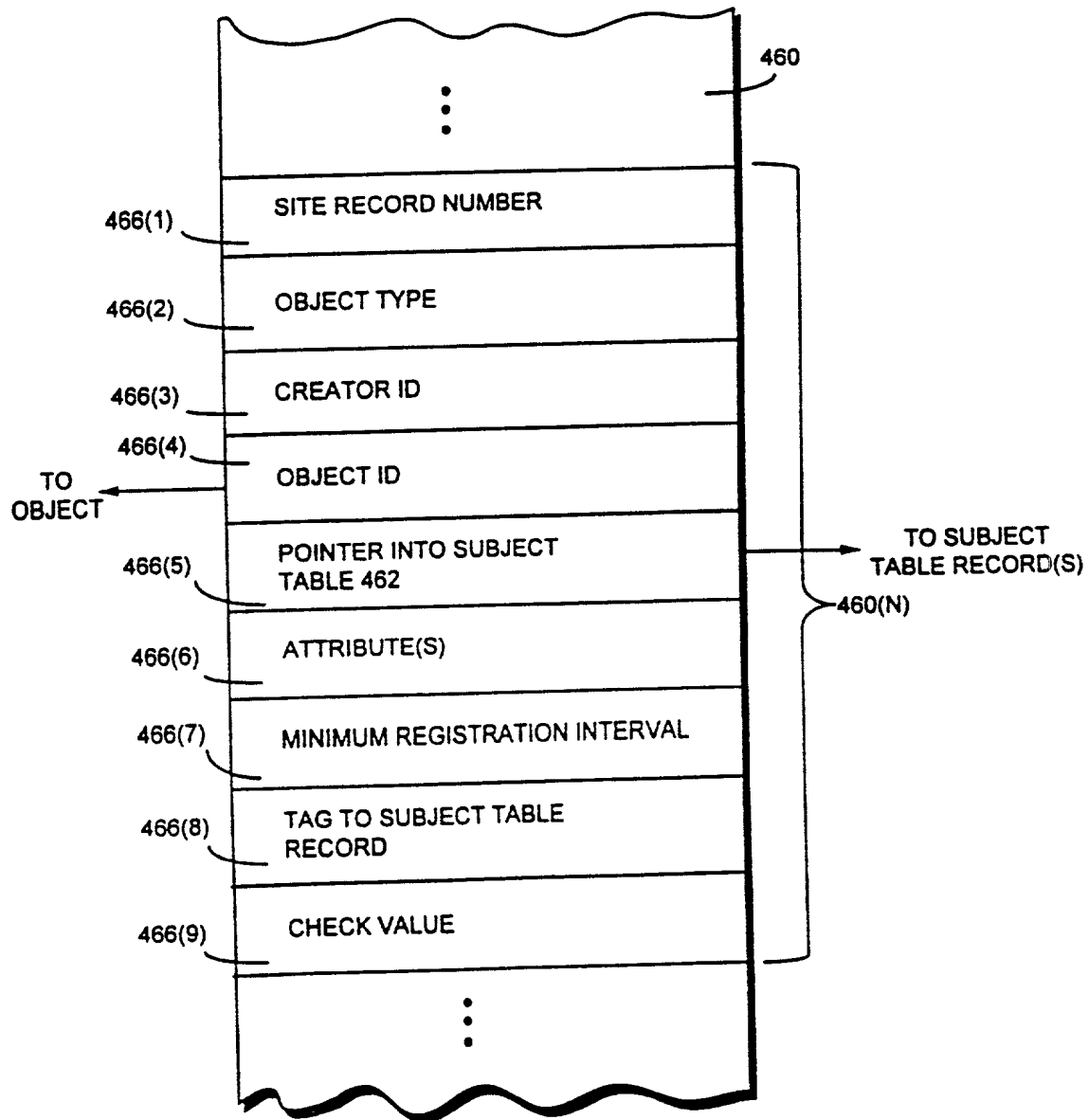


FIG. 31
OBJECT REGISTRATION TABLE

FIG. 32

SUBJECT
TABLE

"HEADER"
468

SUBJECT
RECORD
470(1)

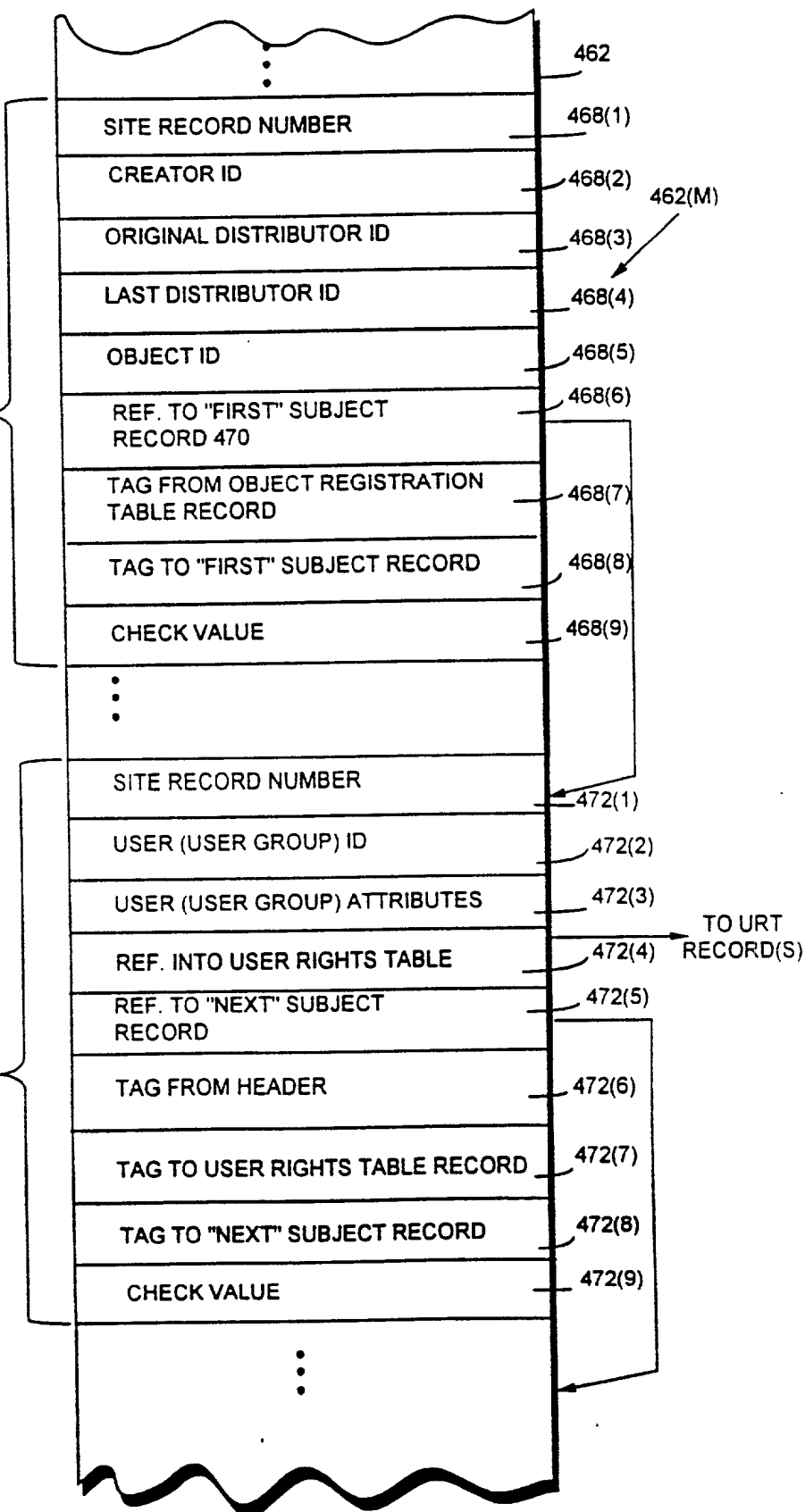


FIG. 33 USER RIGHTS TABLE

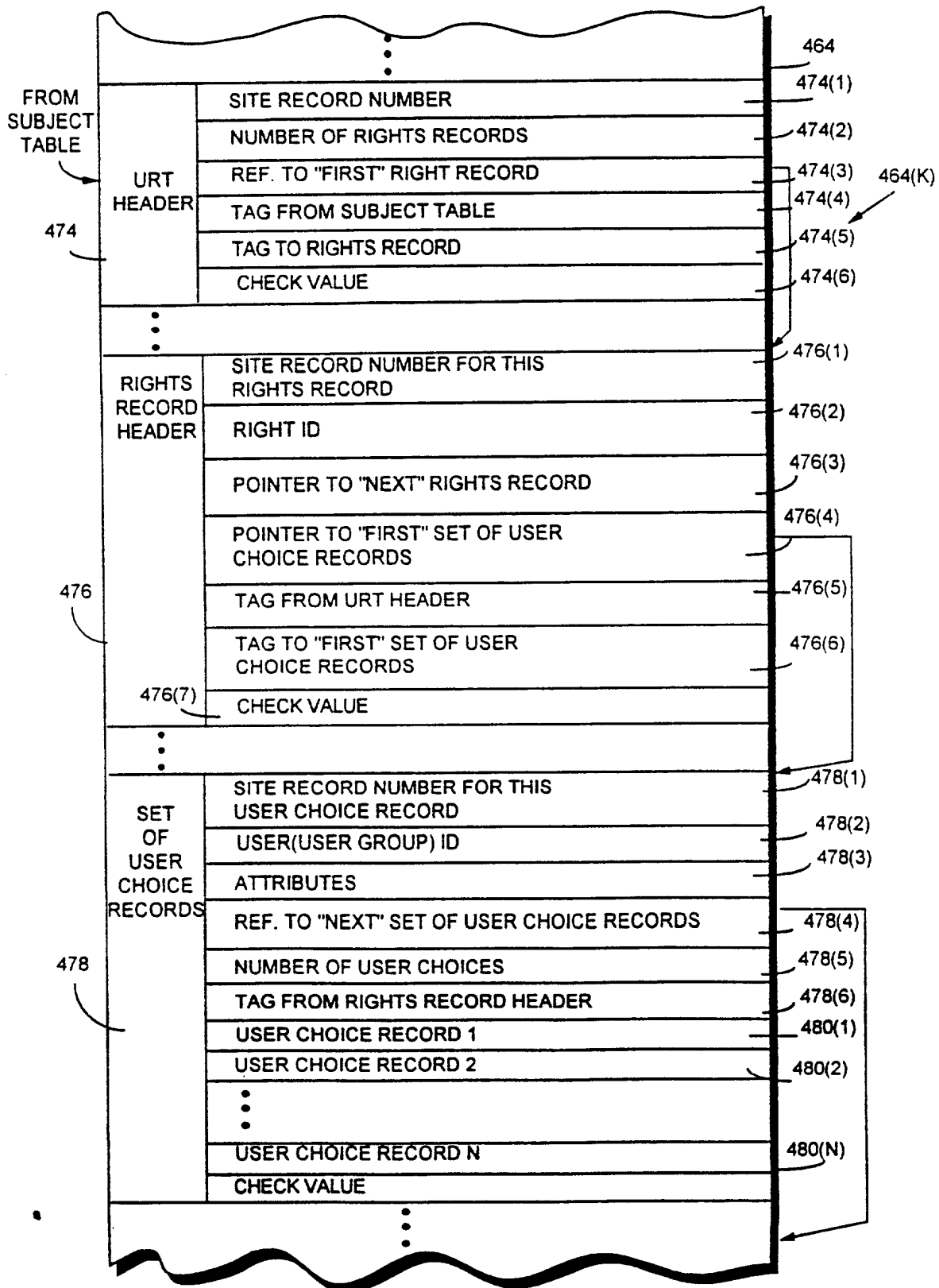


FIG. 34A

SITE RECORD

482(J)		482
TYPE OF RECORD		484(1)
OWNER OR CREATOR OF RECORD		484(2)
CLASS		484(3)
INSTANCE		484(4)
TYPE SPECIFIC DESCRIPTOR (e.g., OBJECT ID) ASSOCIATED WITH RECORD		484(5)
TABLE IN WHICH THE RECORD IS LOCATED		484(6)
POINTER - OFFSET, WITHIN THE TABLE, TO WHERE THE RECORD BEGINS		484(7)
RECORD LENGTH		484(8)
VALIDATION TAG FOR RECORD		484(9)
CHECK VALUE		484(10)

FIG. 34

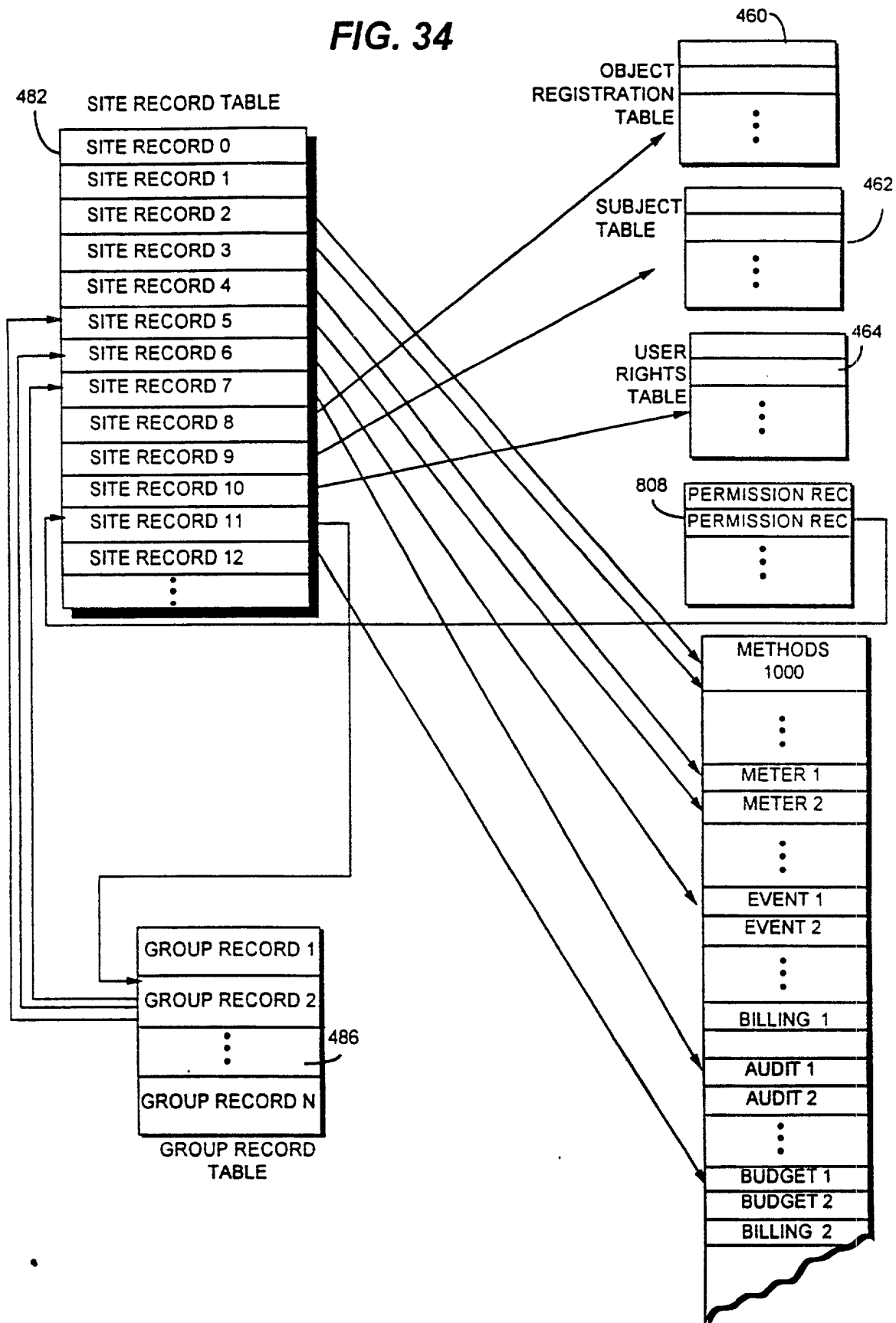


FIG. 34B

GROUP RECORD

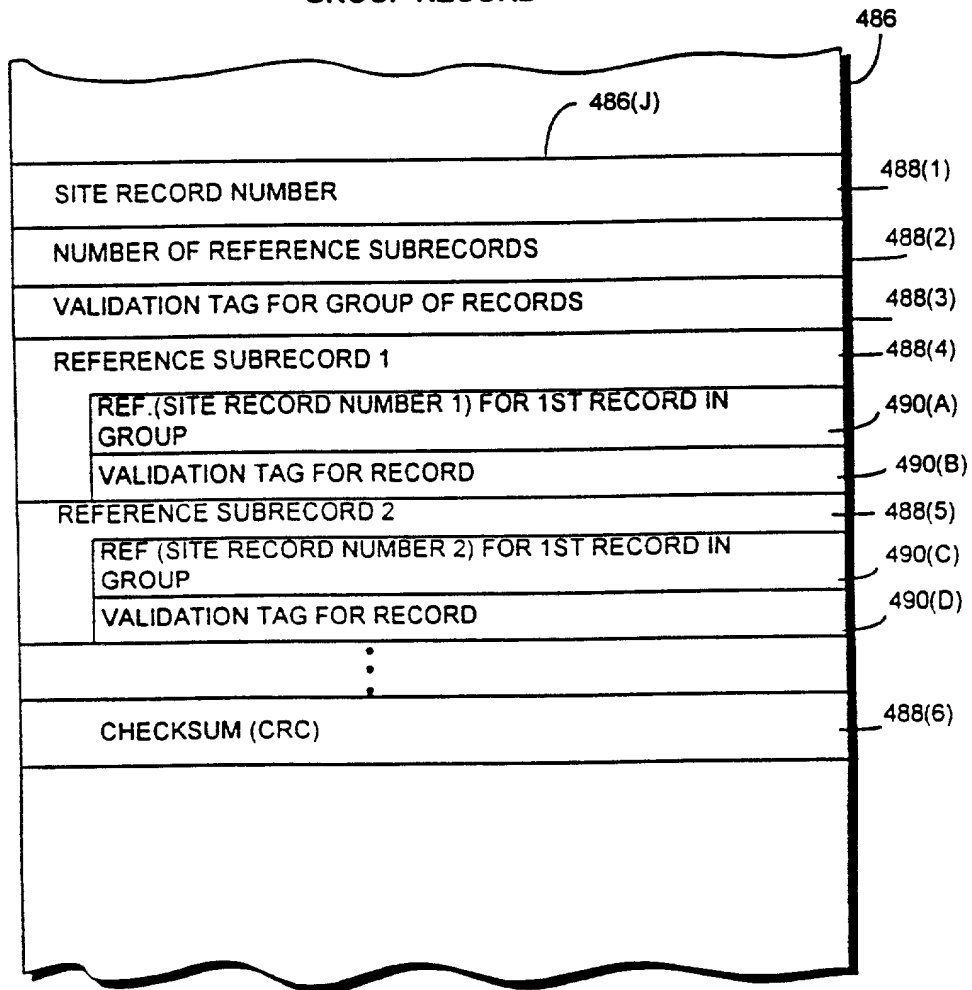


FIG. 35

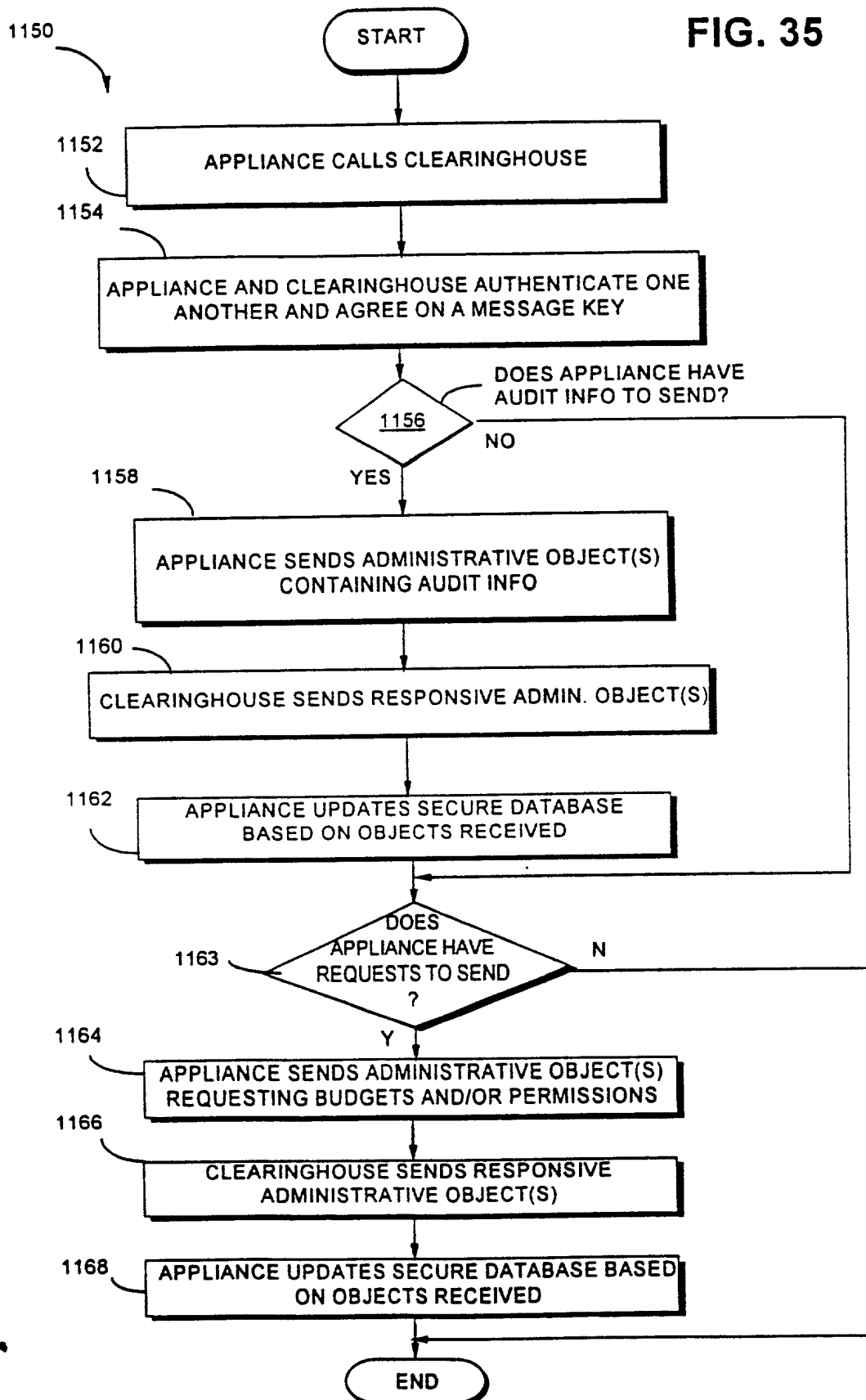


FIG. 36

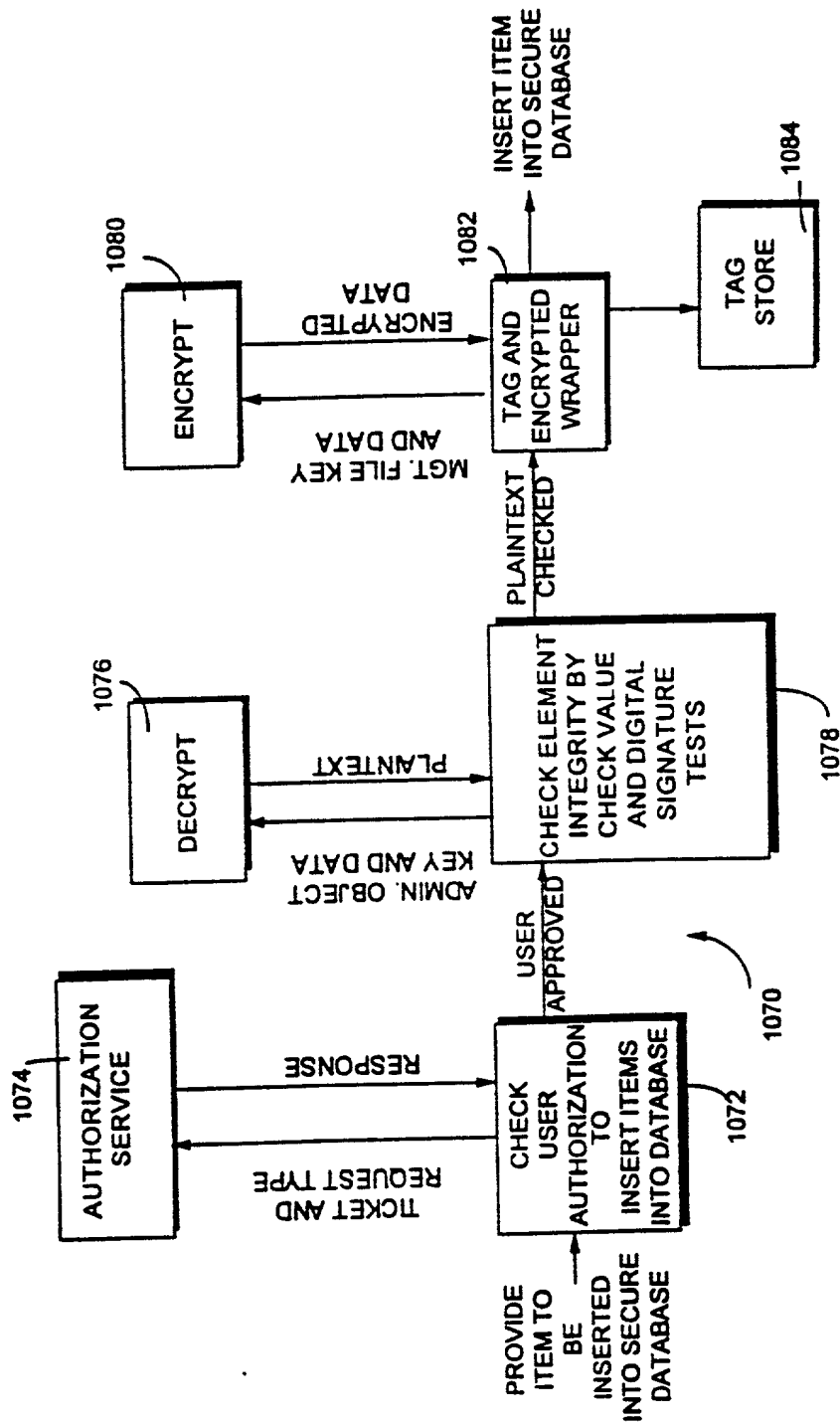


FIG. 37

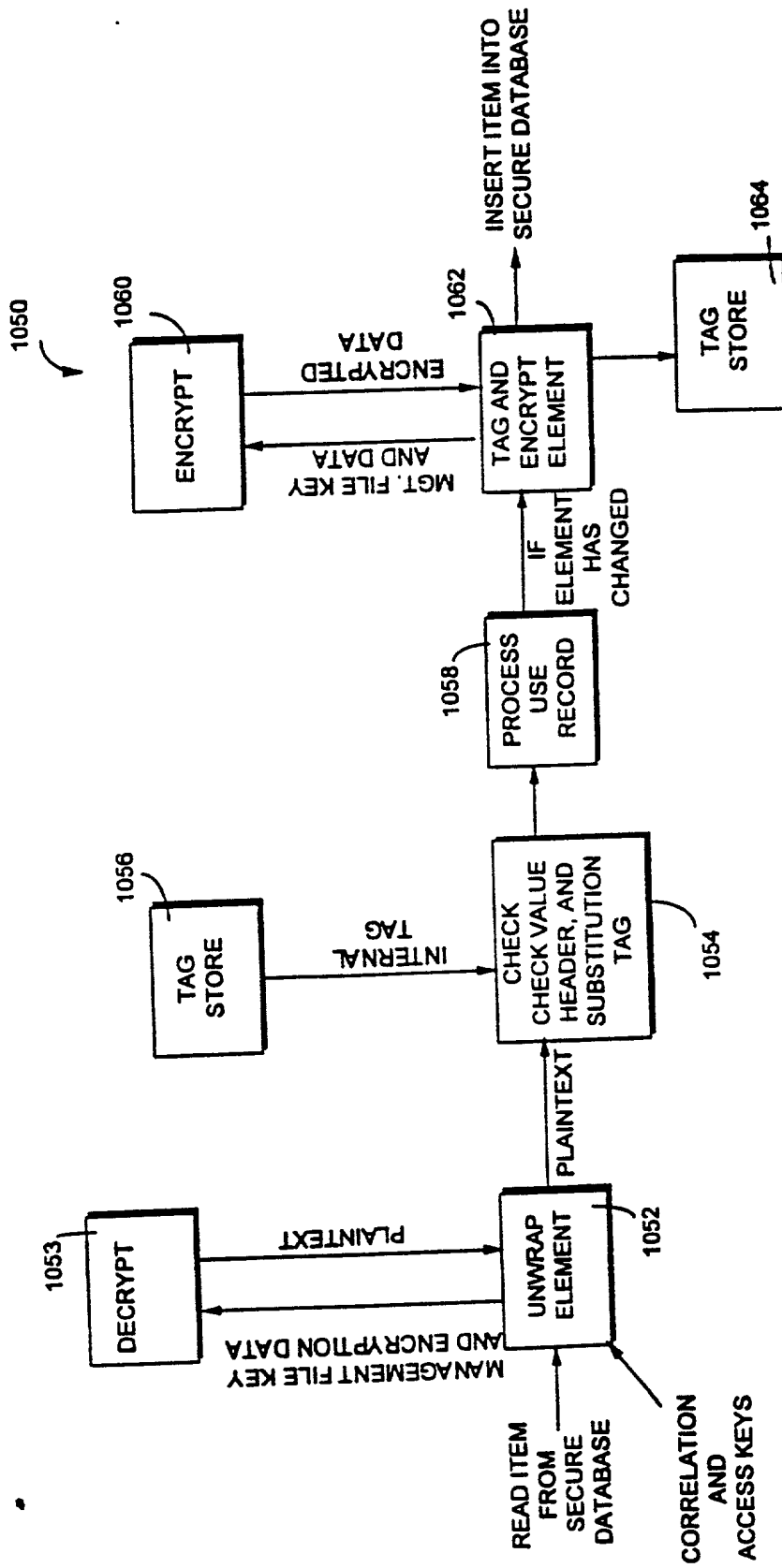


FIG. 38

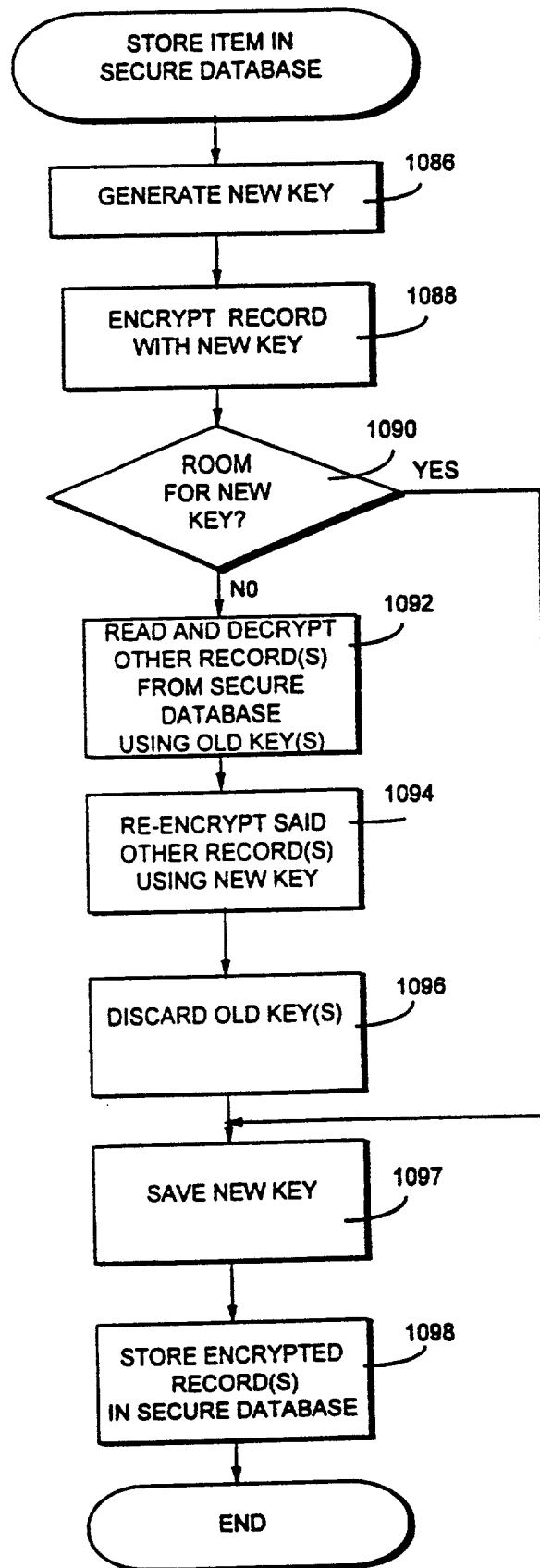


FIG. 39
BACKUP

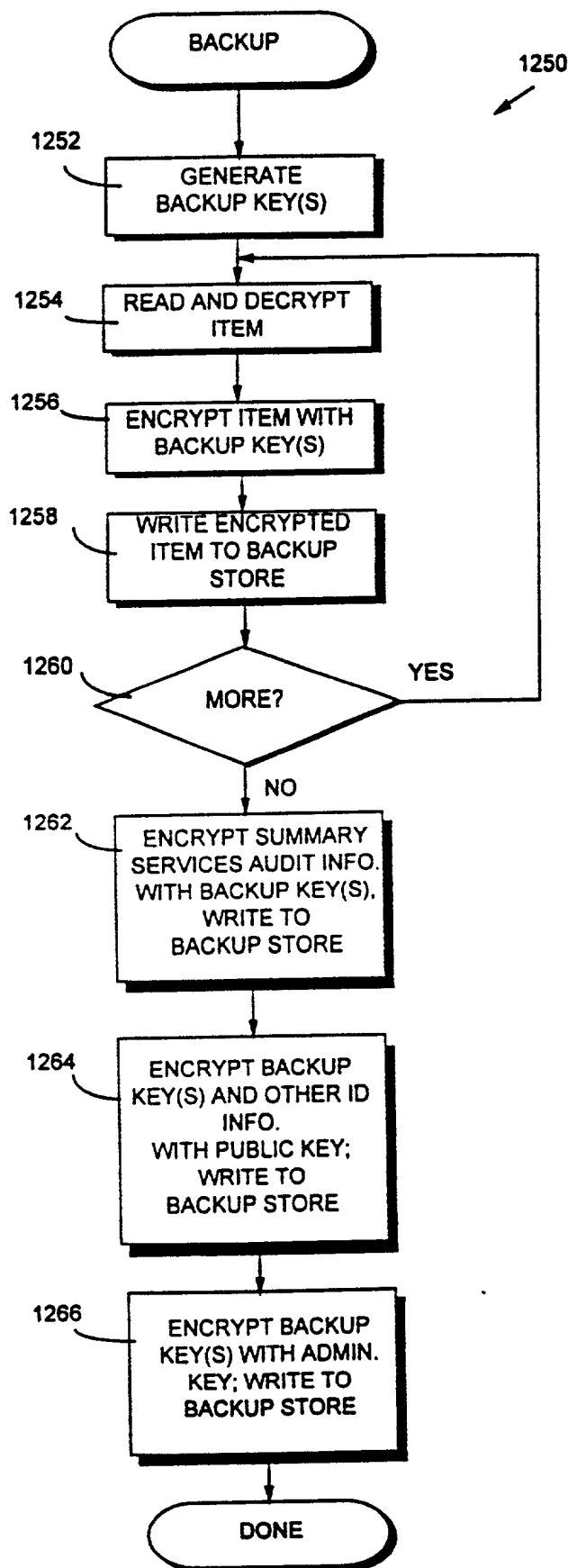
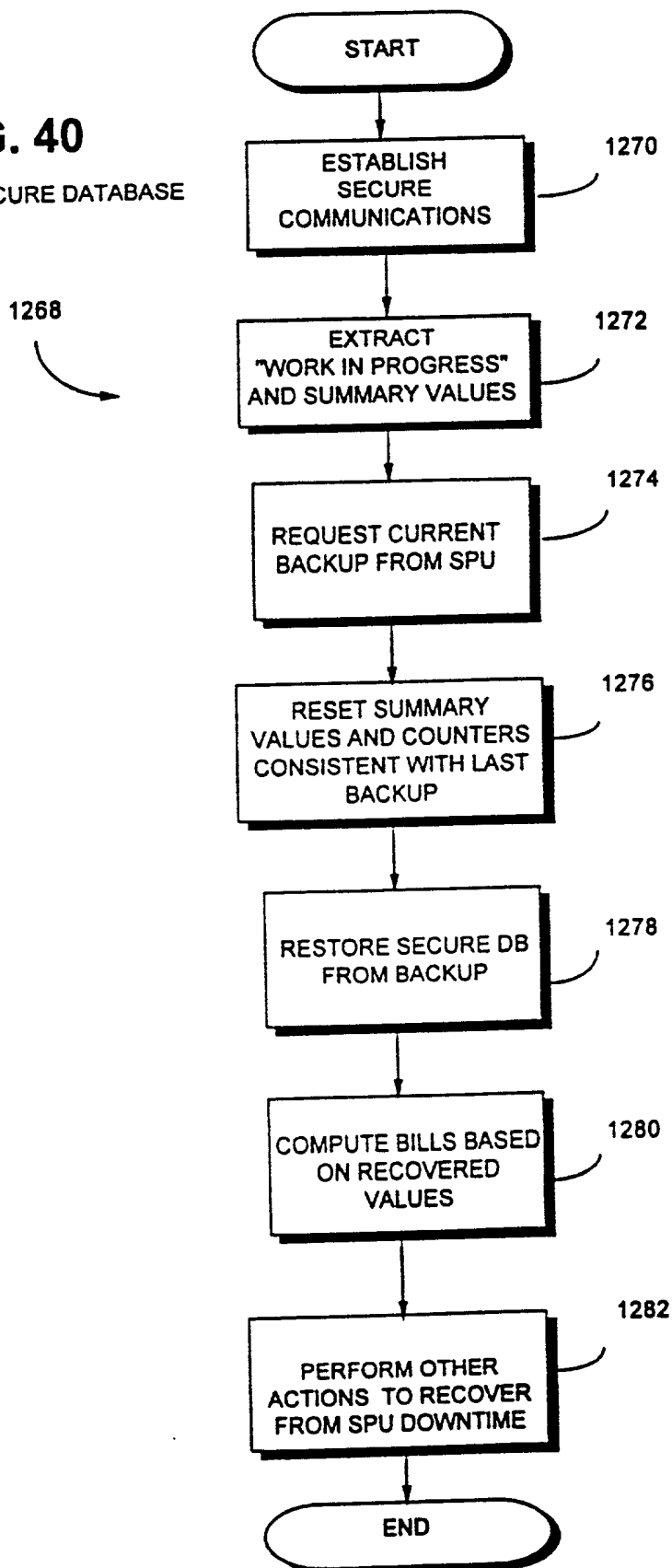


FIG. 40
RECOVER SECURE DATABASE



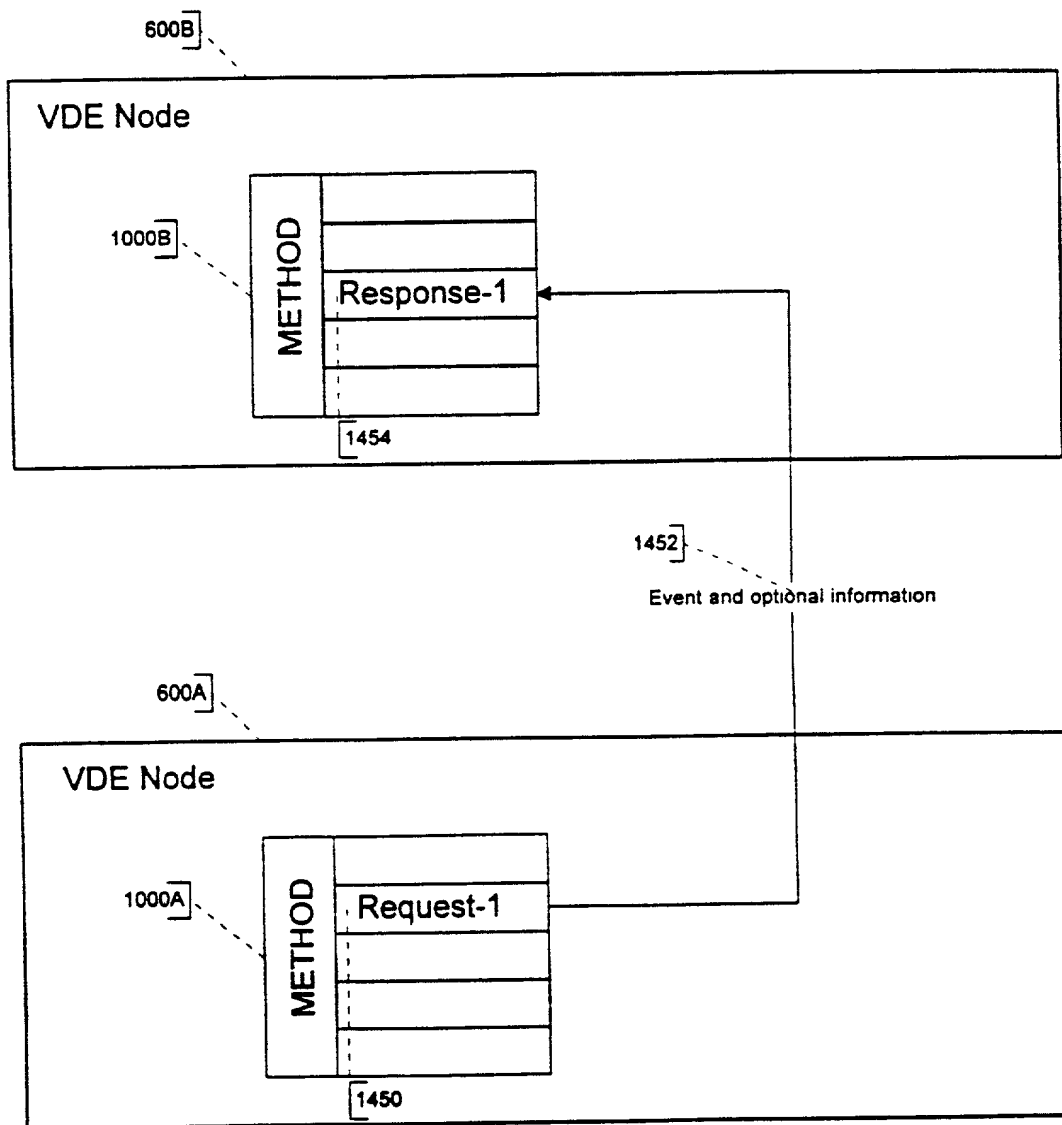


Figure 41a

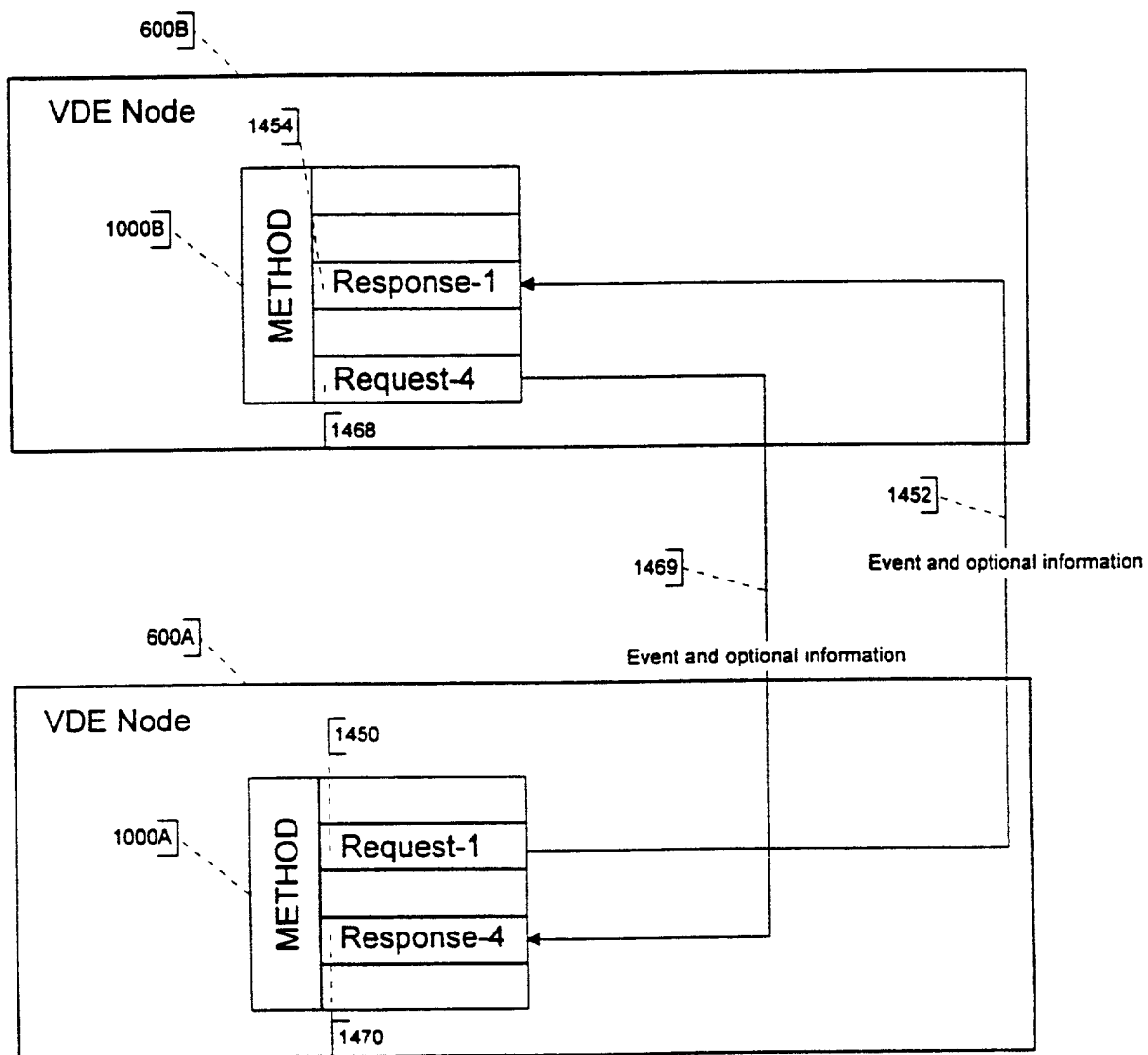


Figure 41b

600C 600B 600A

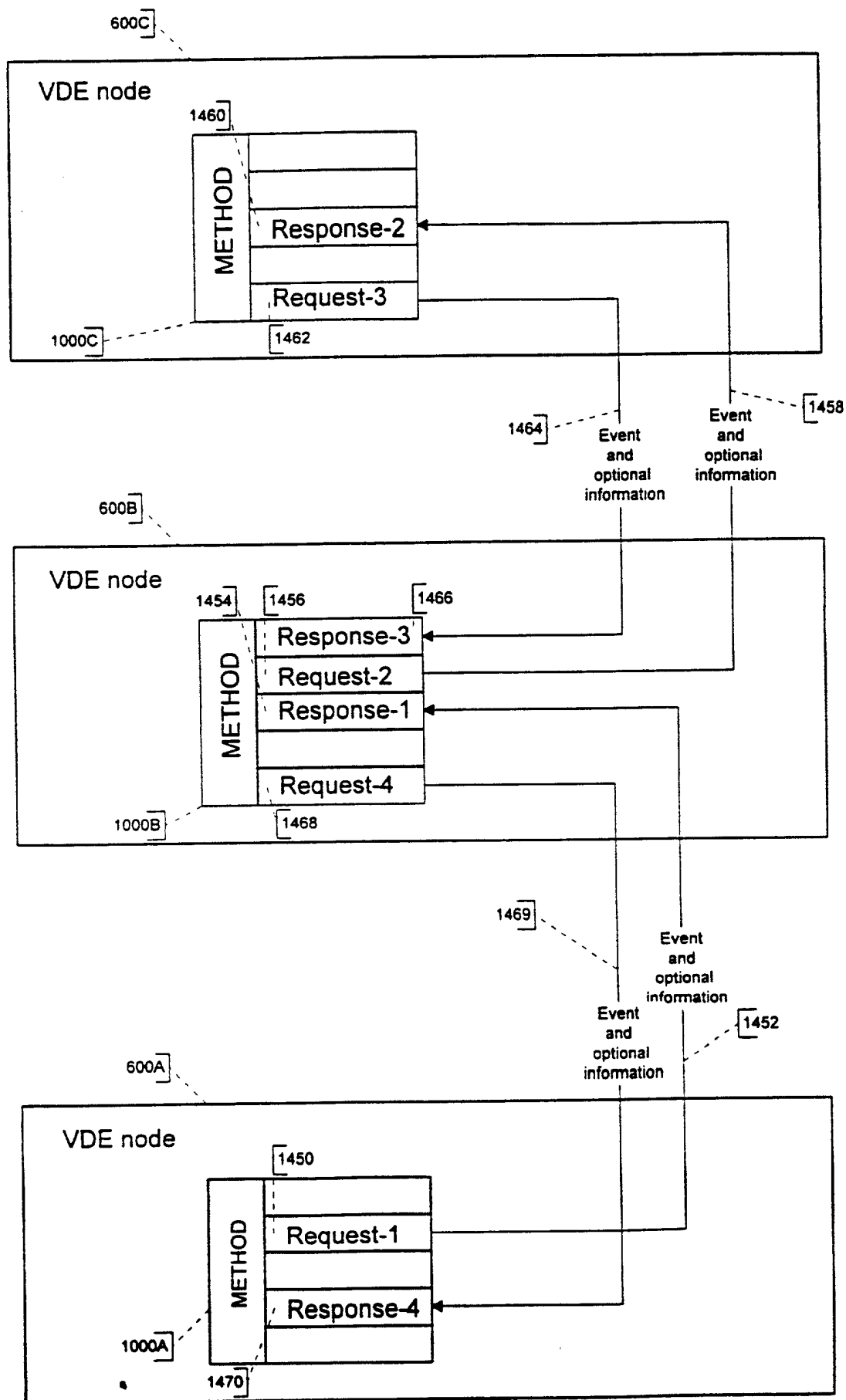


Figure 41c

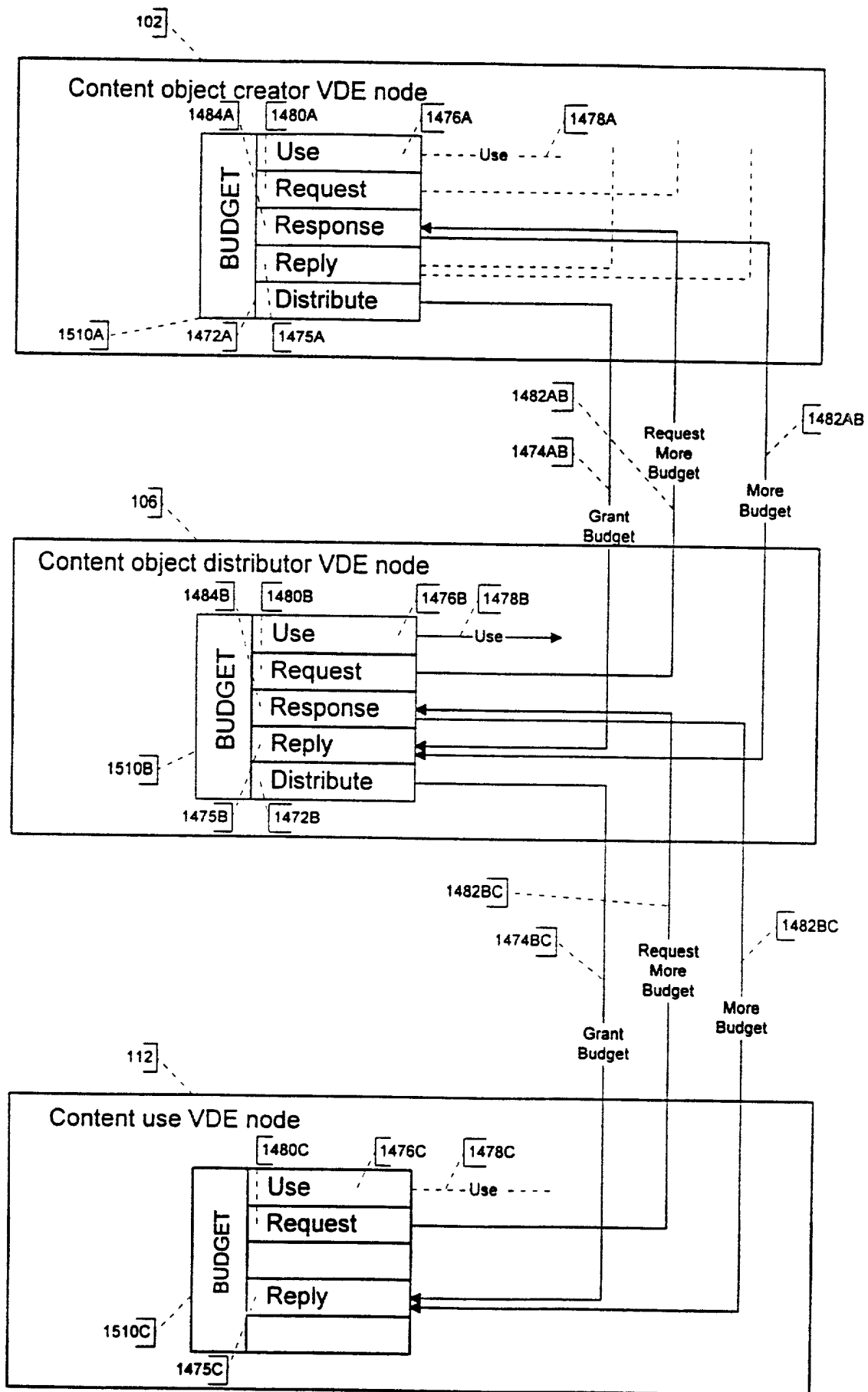


Figure 41d

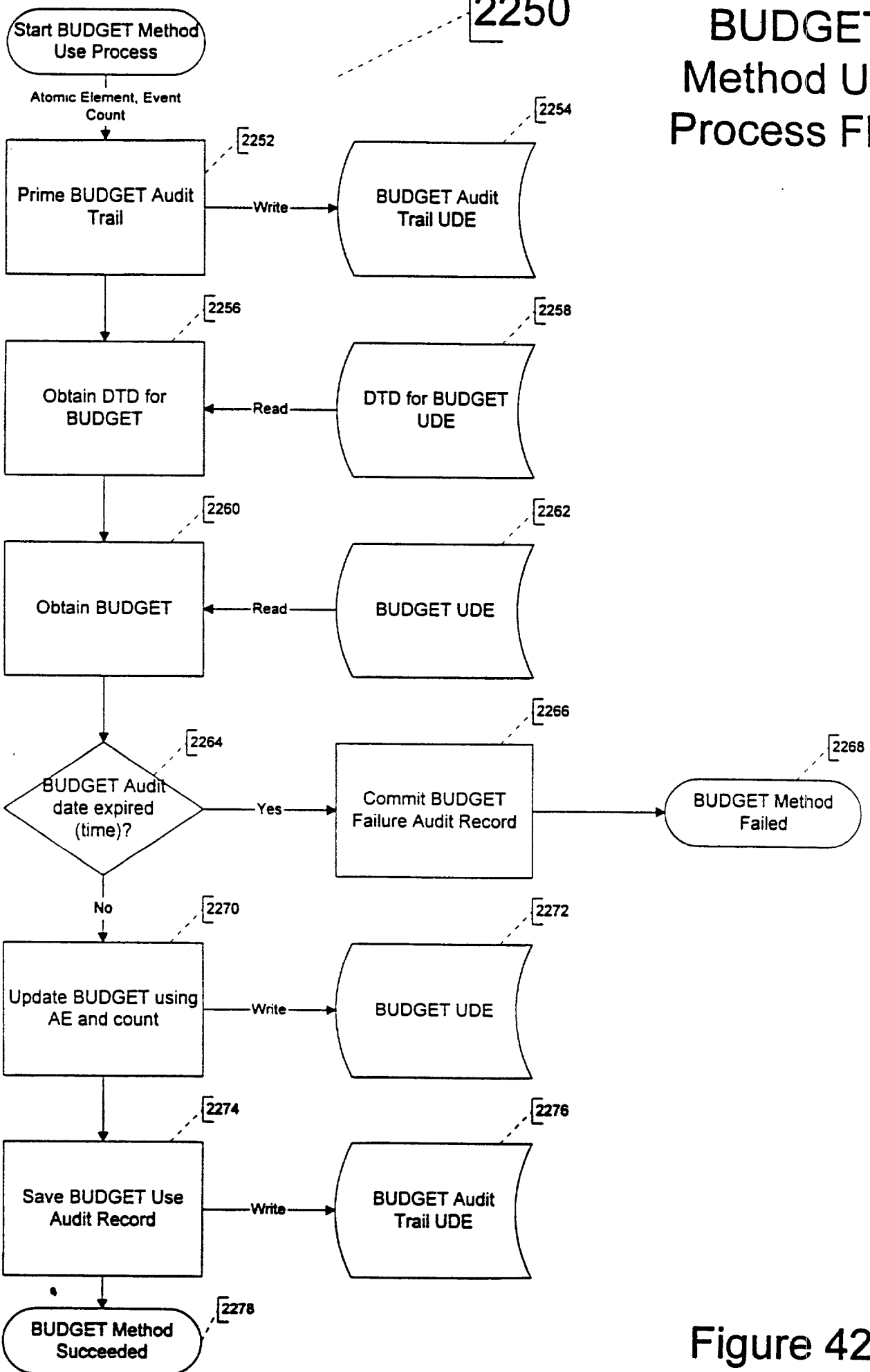


Figure 42a

2250

BUDGET Method Administrative Request Process Flow

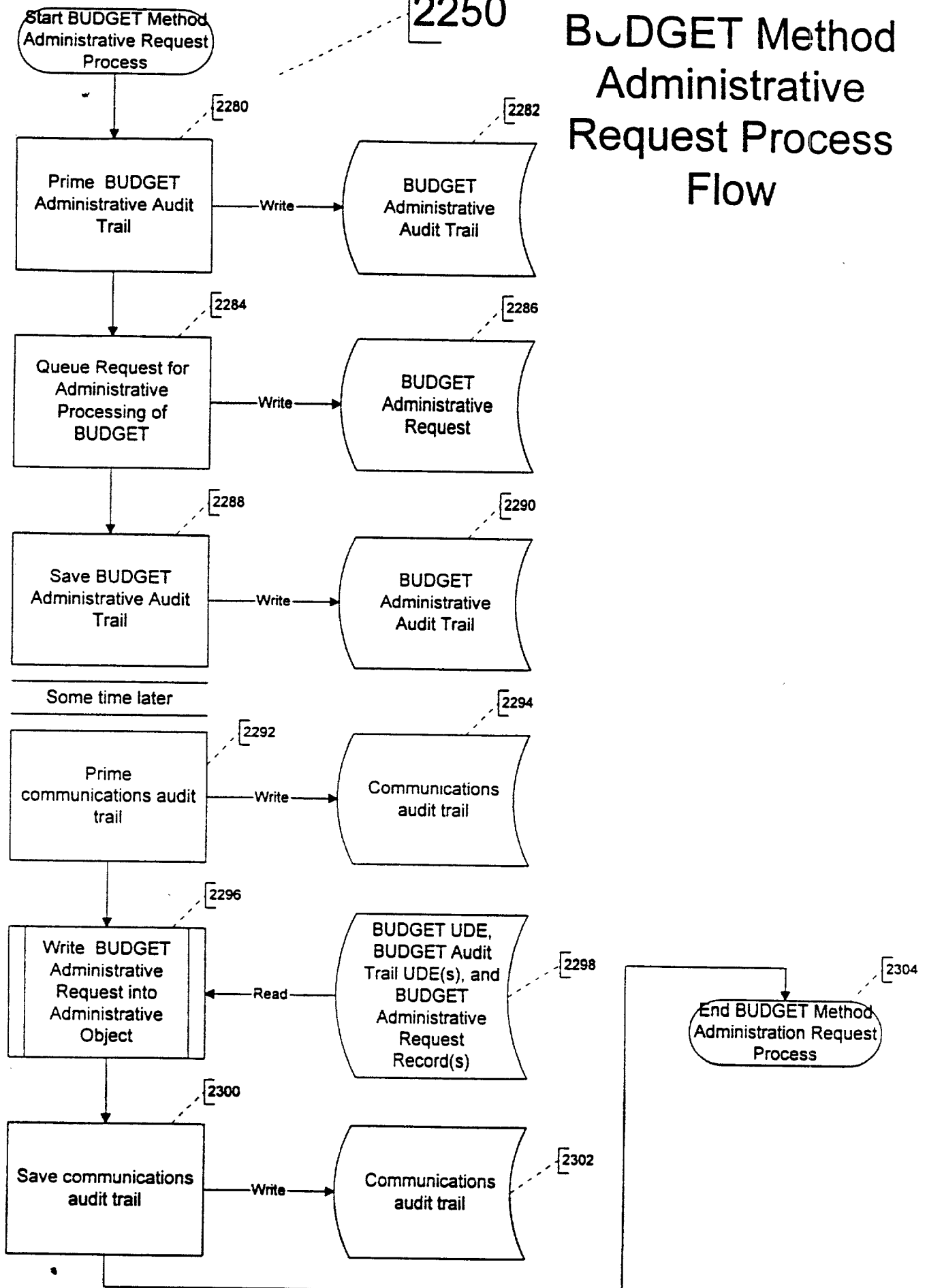


Figure 42b

BUDGET Method Administrative Response Process Flow

2250

Start BUDGET Method
Administrative
Response Process

2306

Prime BUDGET
Communications and
Response Audit Trail

Write

2308

Communications
and Response
Audit Trail

2310

Unpack Admin.
Object and retrieve
BUDGET
request(s), audit
trail(s) and
record(s)

Write

2312

BUDGET
Administrative
Request, Budget
records, and audit
information

2314

Retrieve request and
determine the
response method to
run to process the
request

Read

2316

Administrative
Request

2318

Send event(s)
contained in
Request record(s)
to the Response
Method and
generate
Response records
and Response
request

Read/Write

2320

BUDGET Request
and Response
records

2324

Write BUDGET
Administrative
Response records
into Administrative
Object

Read

2322

BUDGET UDE and
BUDGET
Administrative
Response
Records

2326

Save communications
and response
processing audit trail

Write

2328

Communications
and response
processing audit
trail

2330

End BUDGET Method
Administration
Response Process

Figure 42c

2250

BUDGET Method Administrative Reply Process Flow

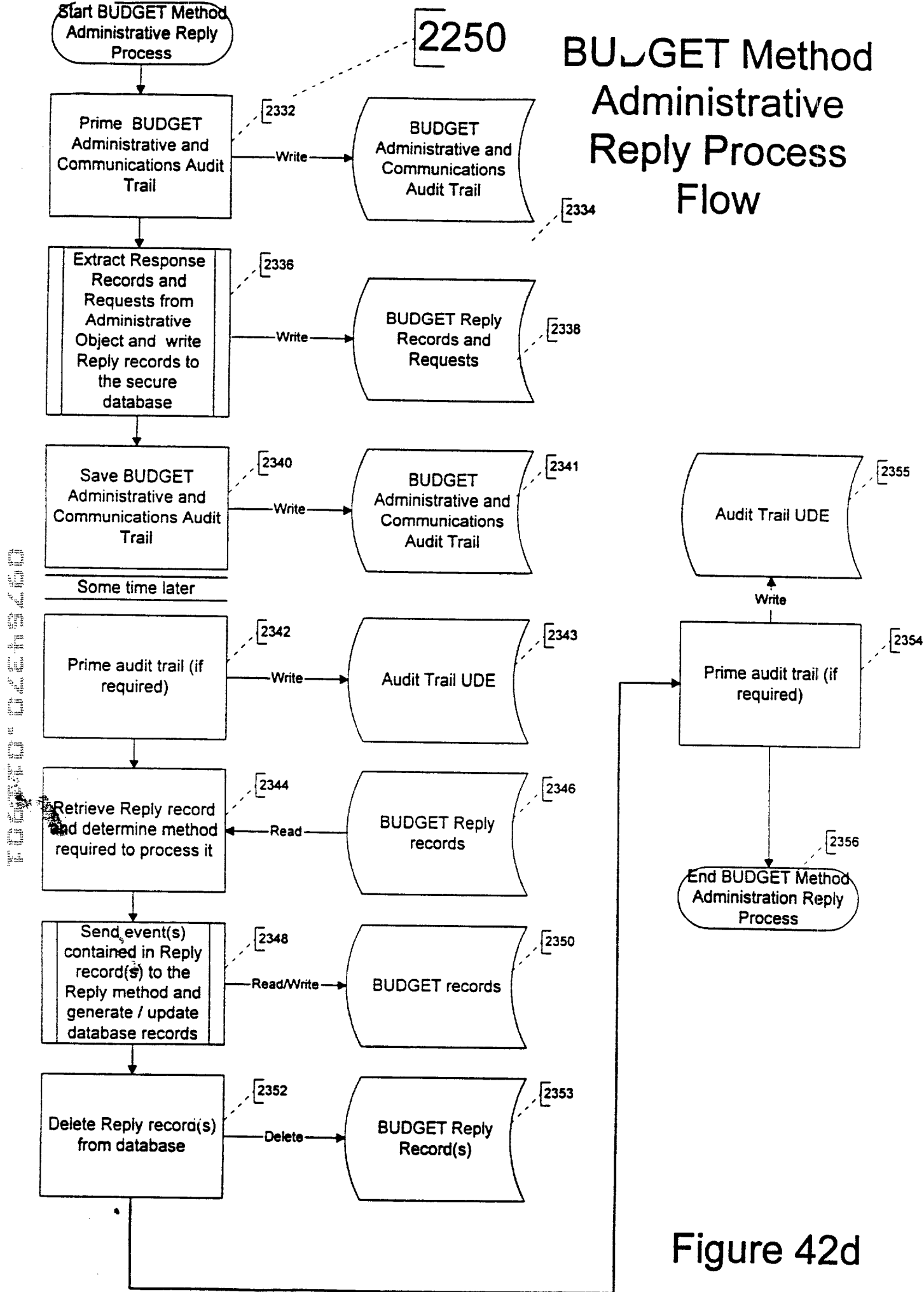


Figure 42d

2400



REGISTER Method Administrative Request Process Flow

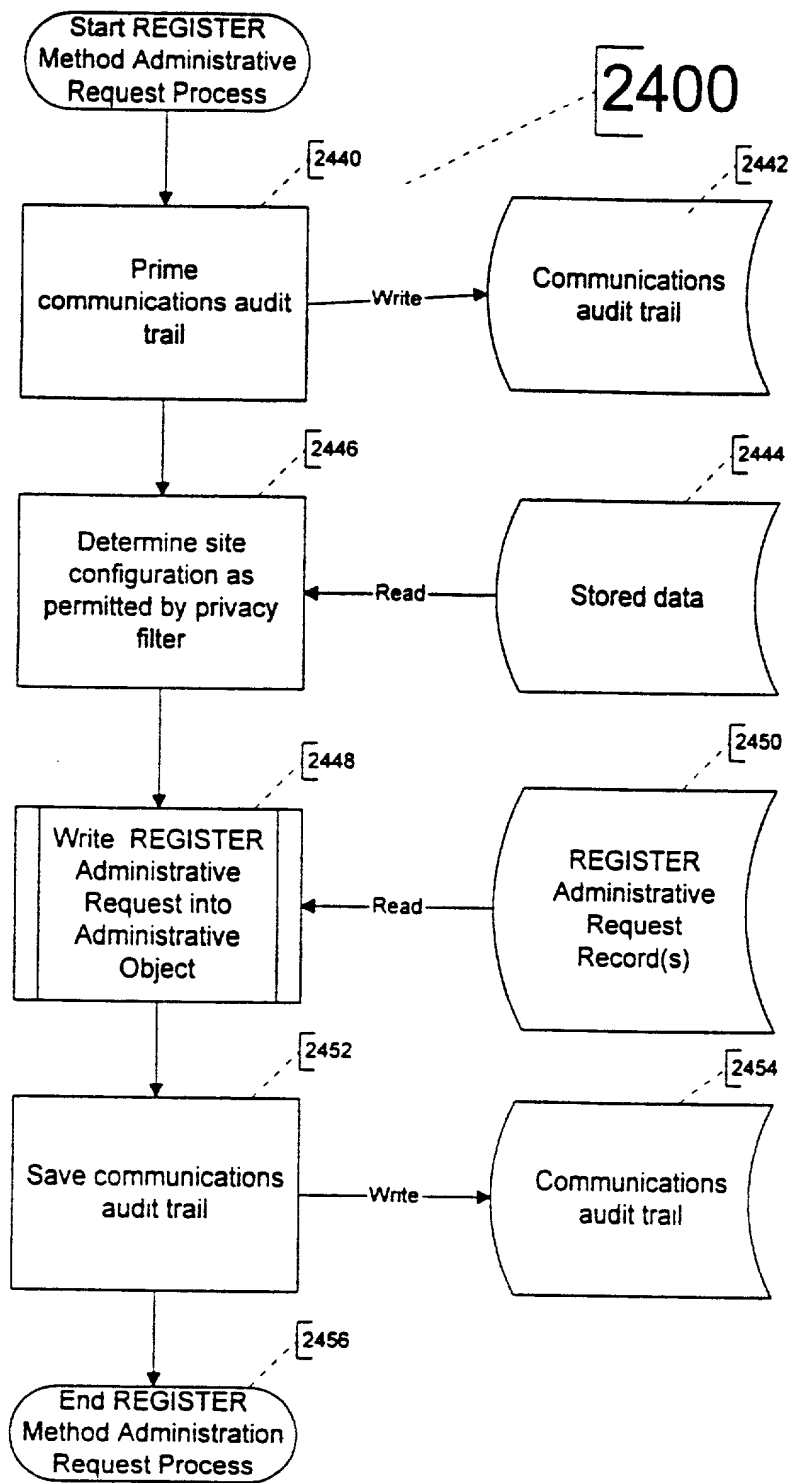


Figure 43b

REGISTER Method Administrative Response Process Flow

2400

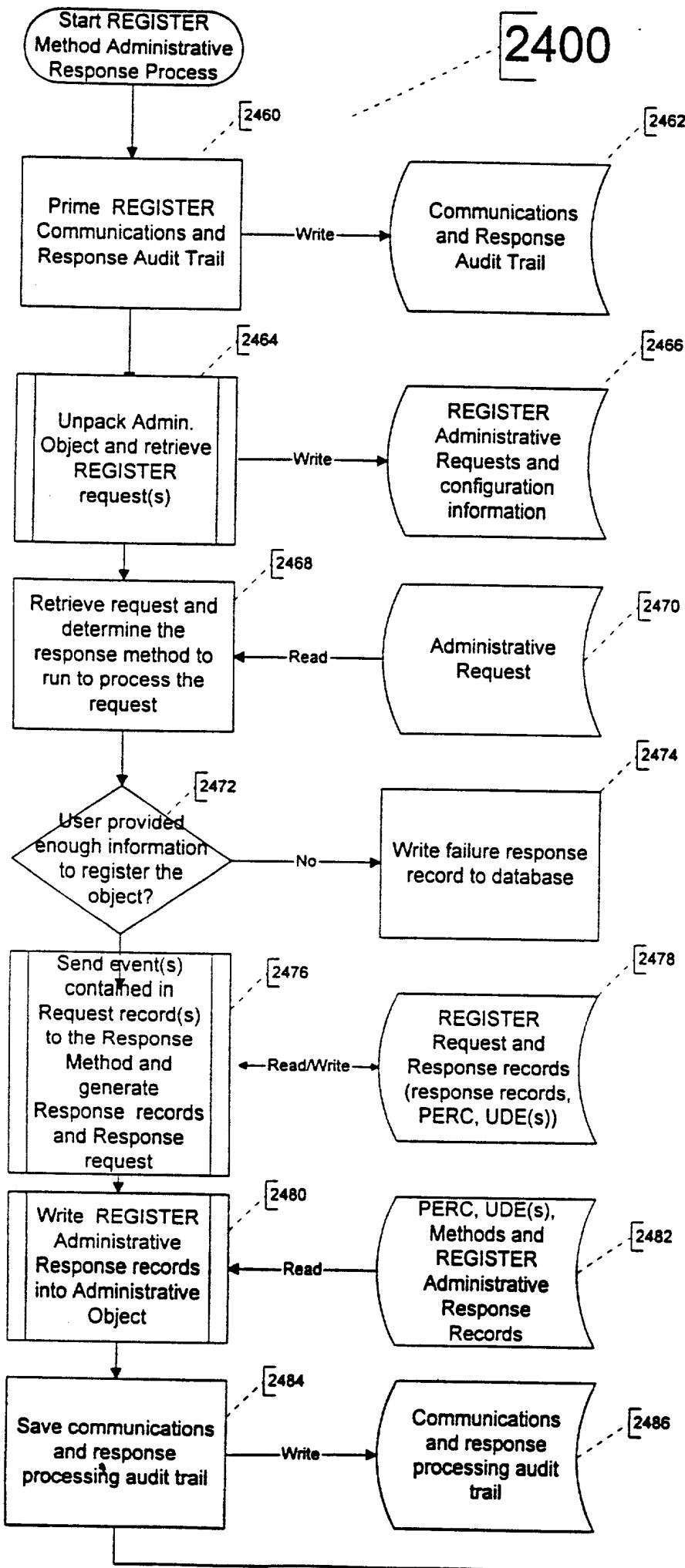


Figure 43c

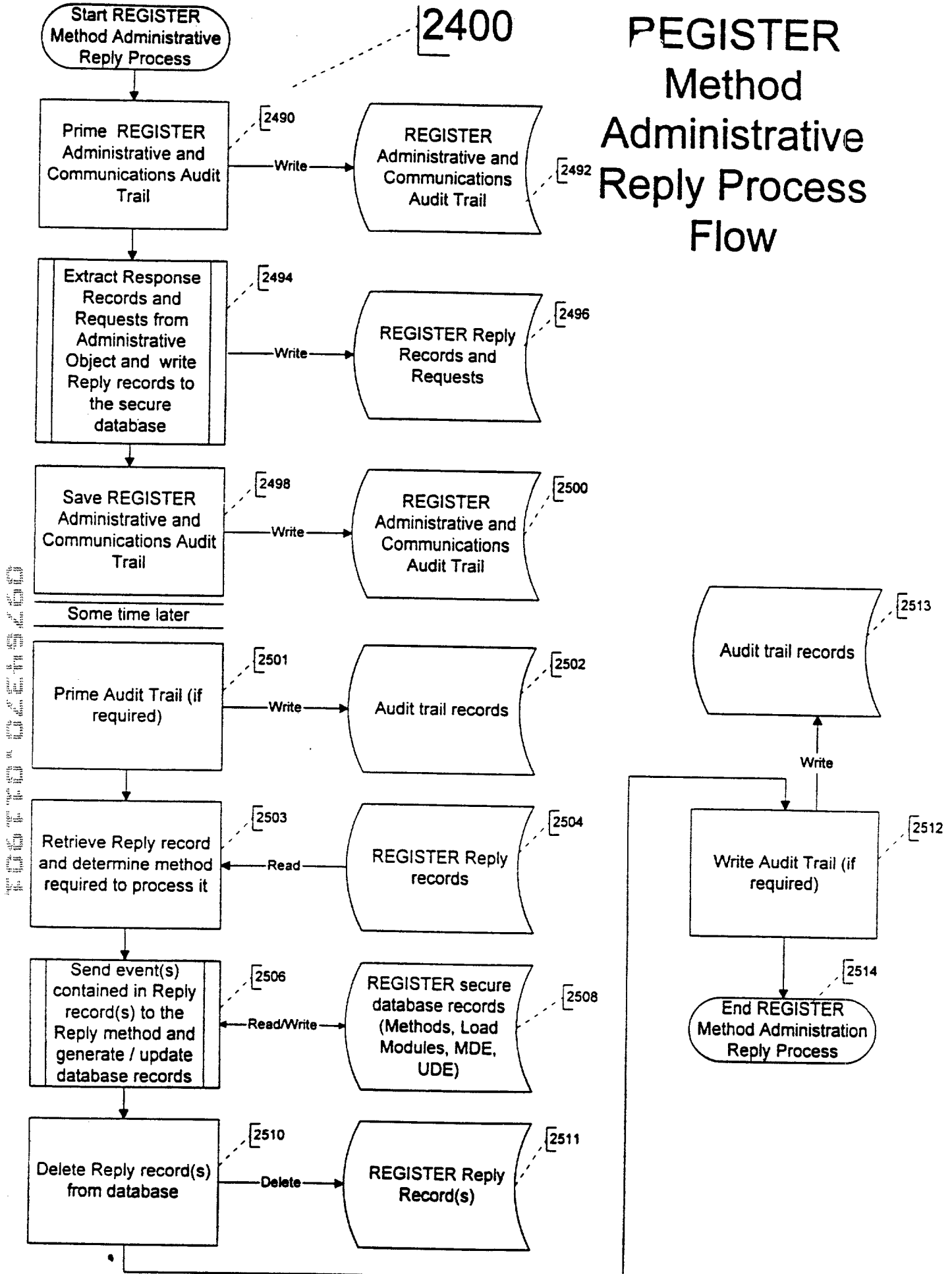


Figure 43d

2520

AUDIT Method Administrative Request Process Flow

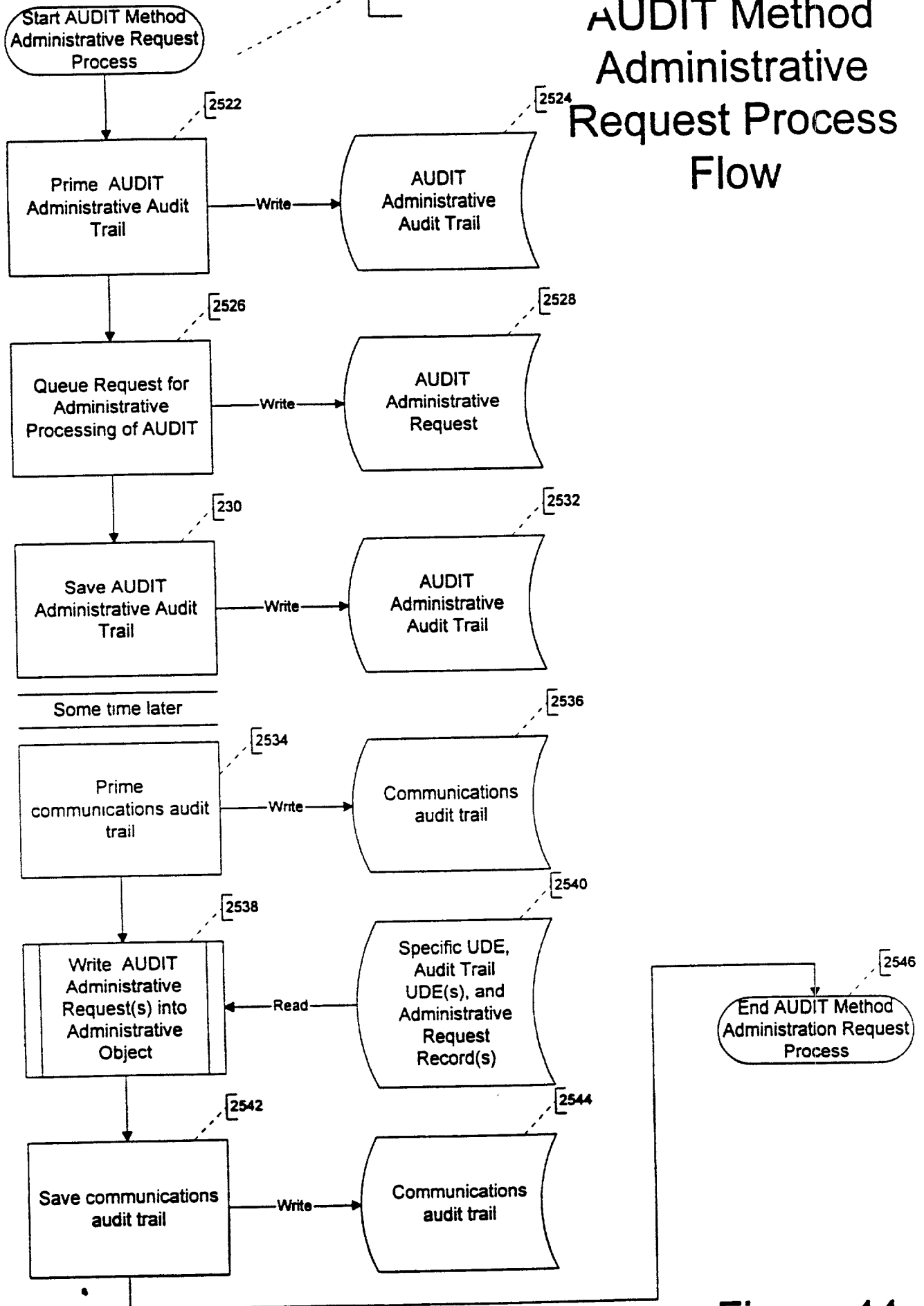


Figure 44a

AUDIT Method Administrative Response Process Flow

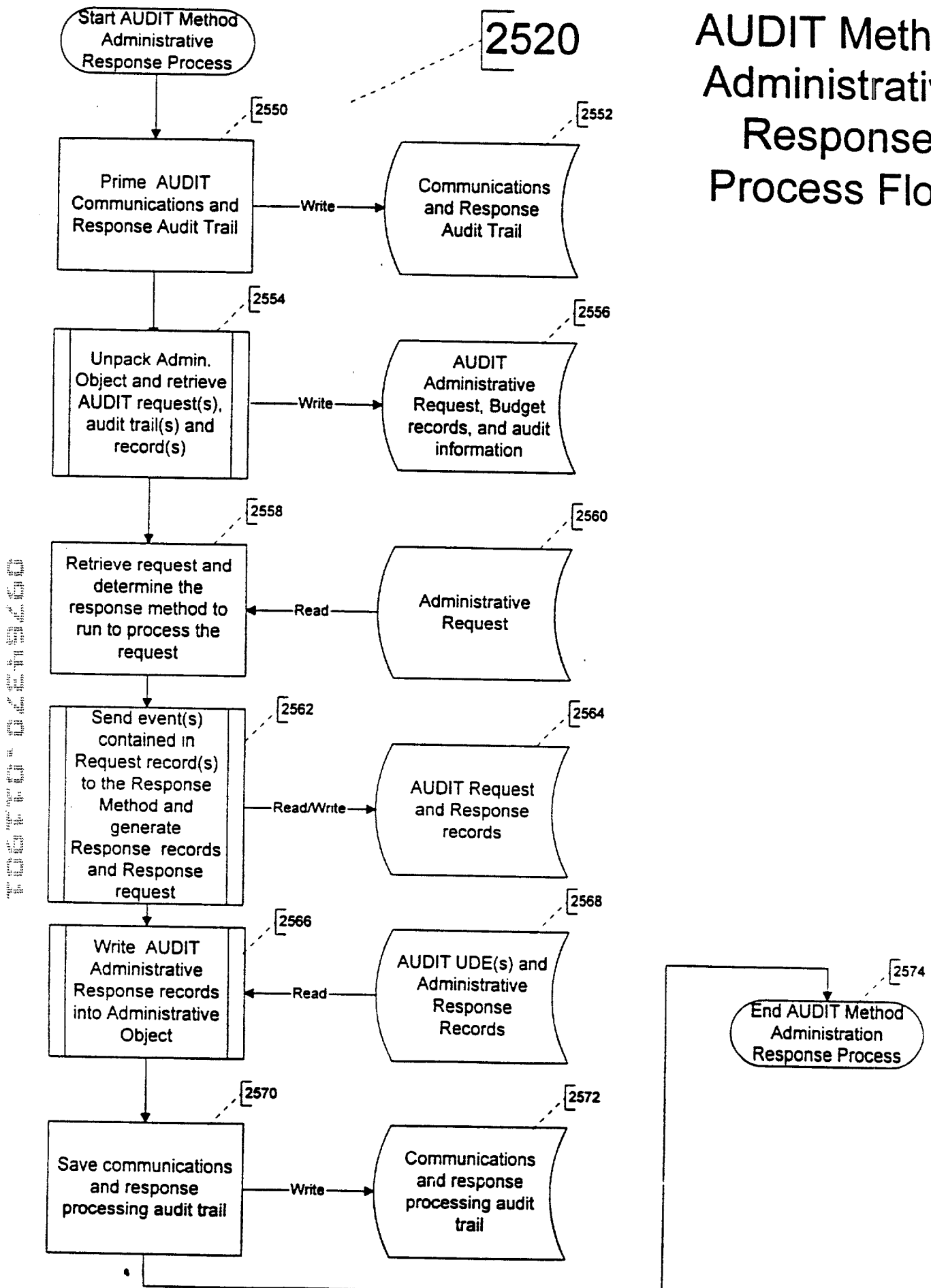


Figure 44b

2520

AUDIT Method Administrative Reply Process Flow

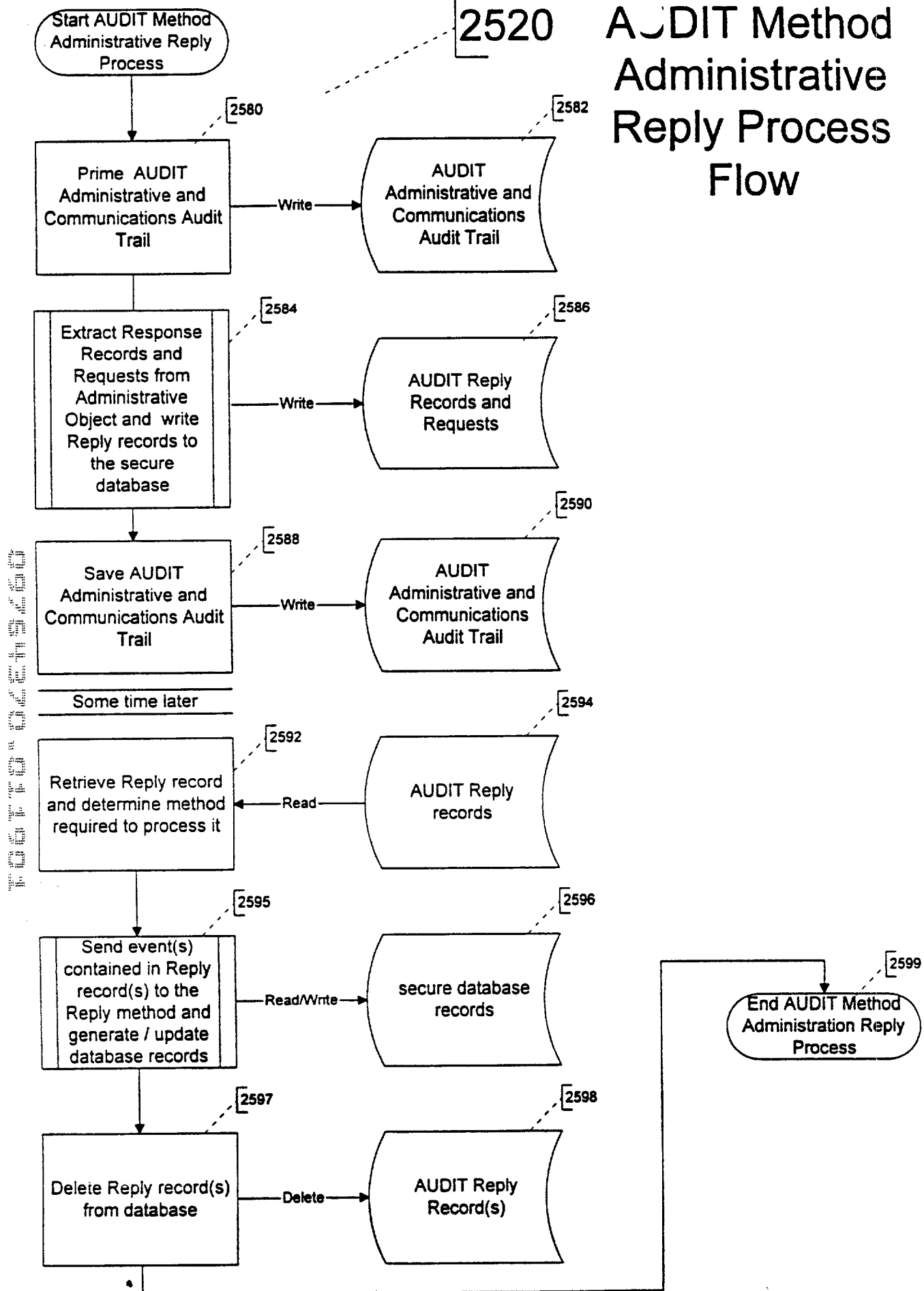


Figure 44c

FIG. 45

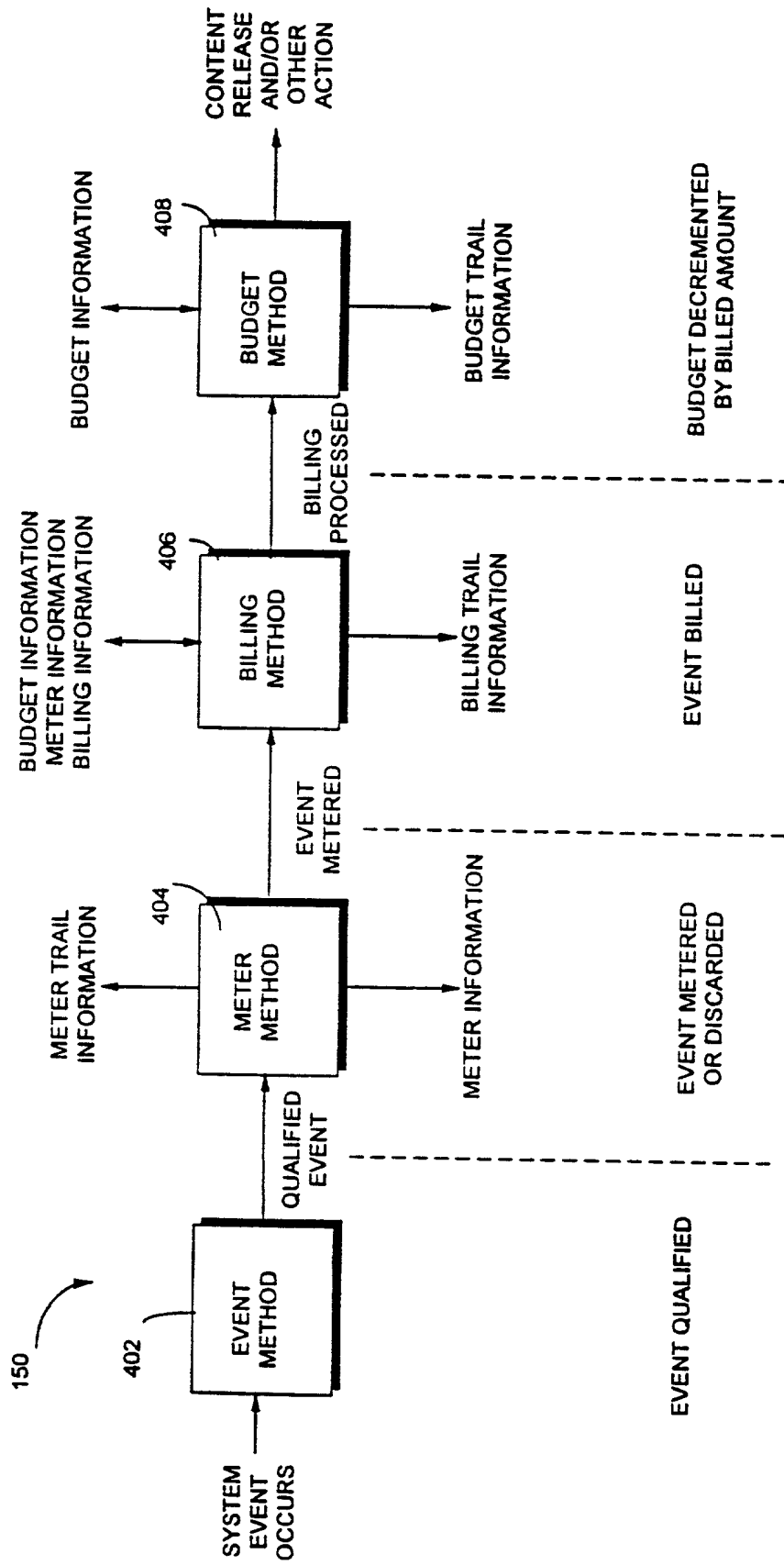


FIG. 46

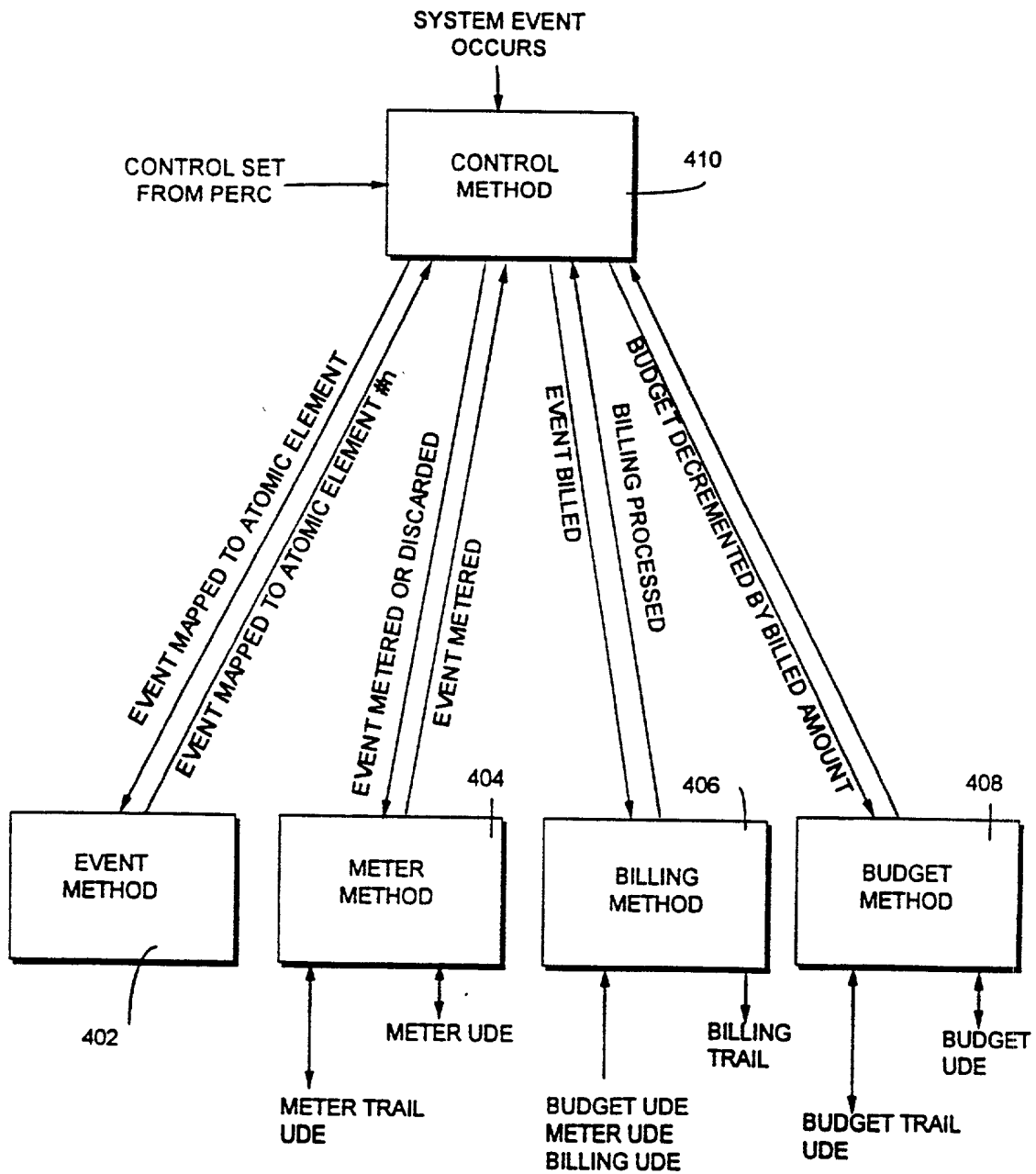
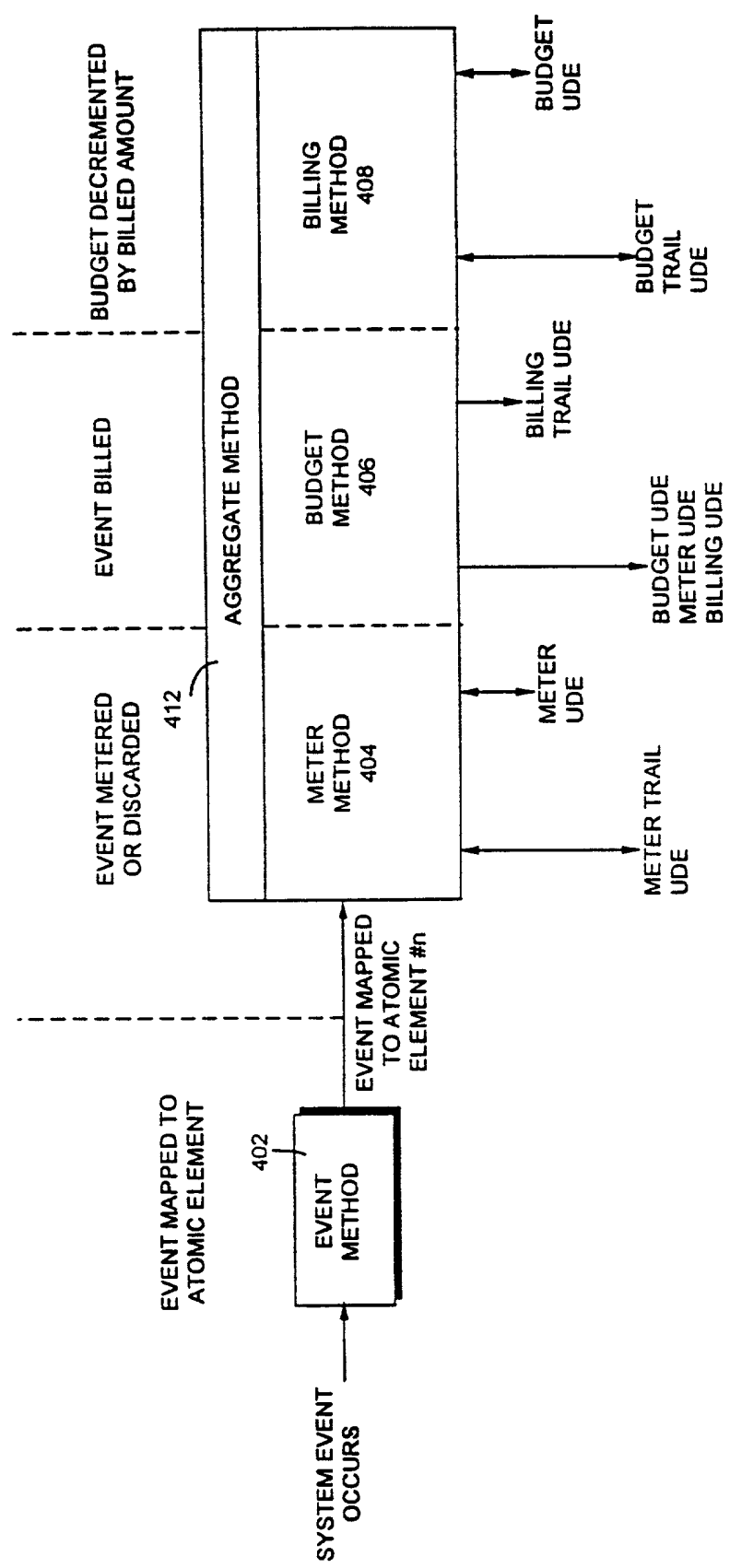


FIG. 47



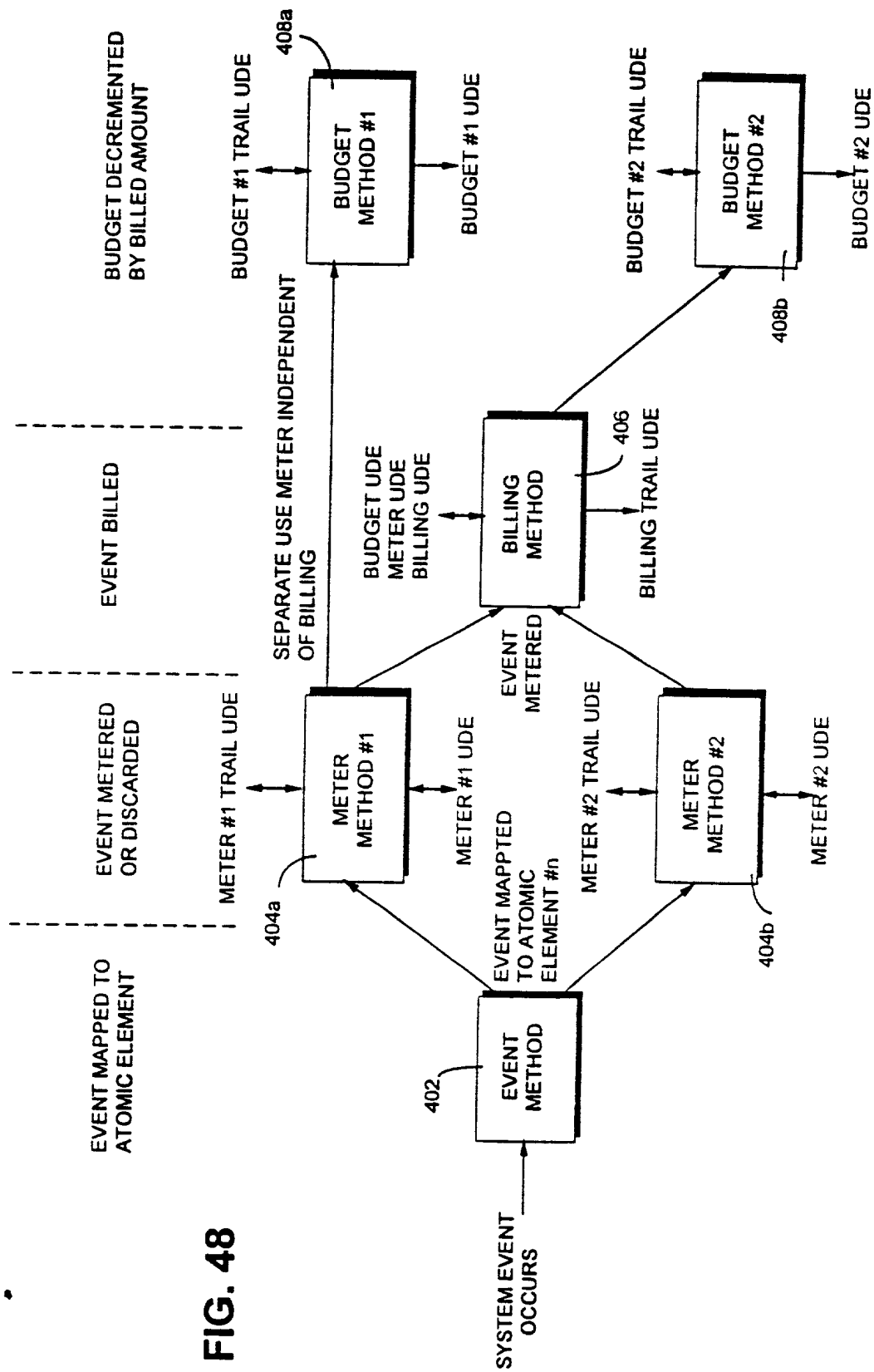


FIG. 48

OPEN Method Use Process Flow

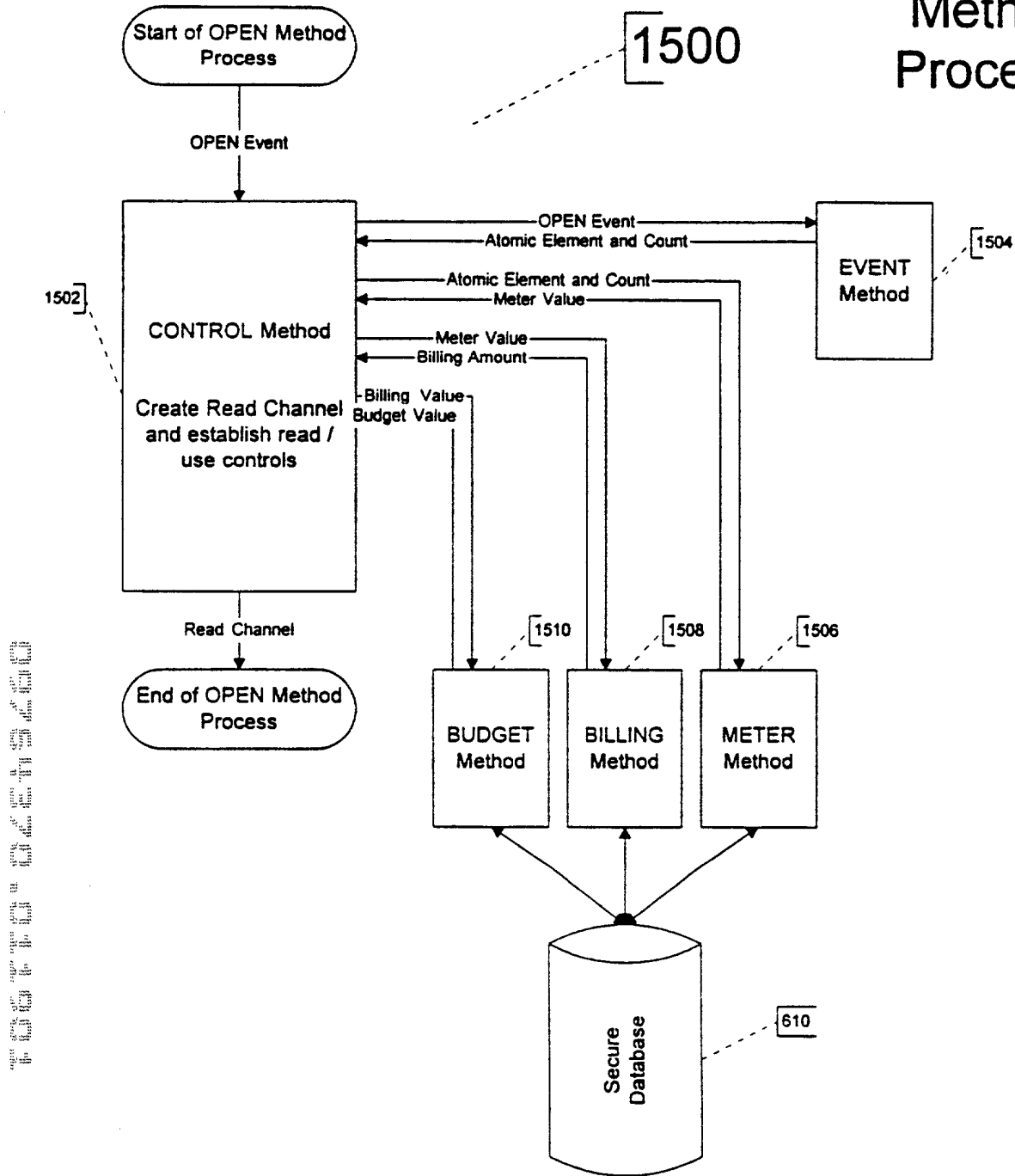


Figure 49

1500

Start of OPEN Method
Process

1502

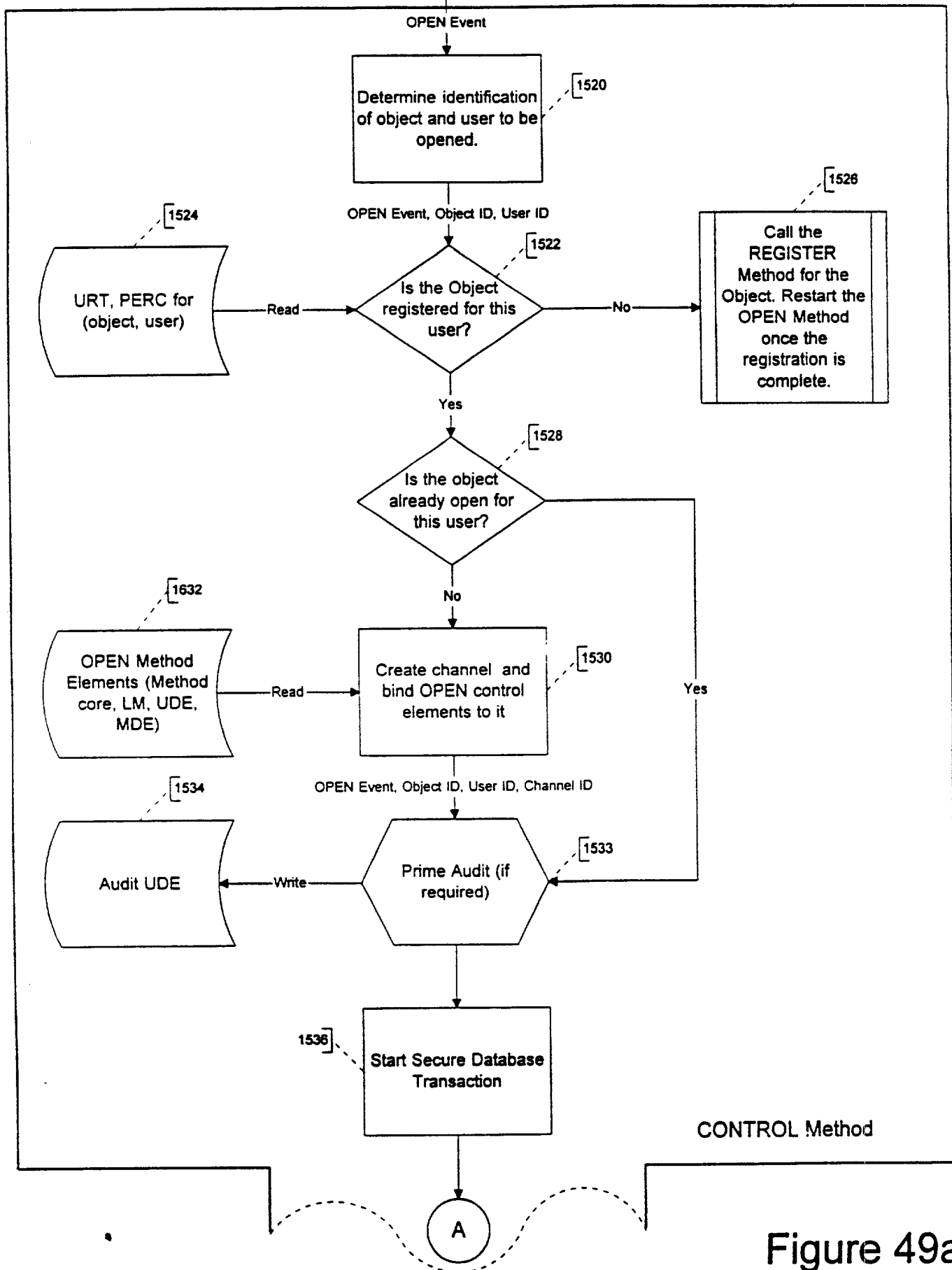


Figure 49a

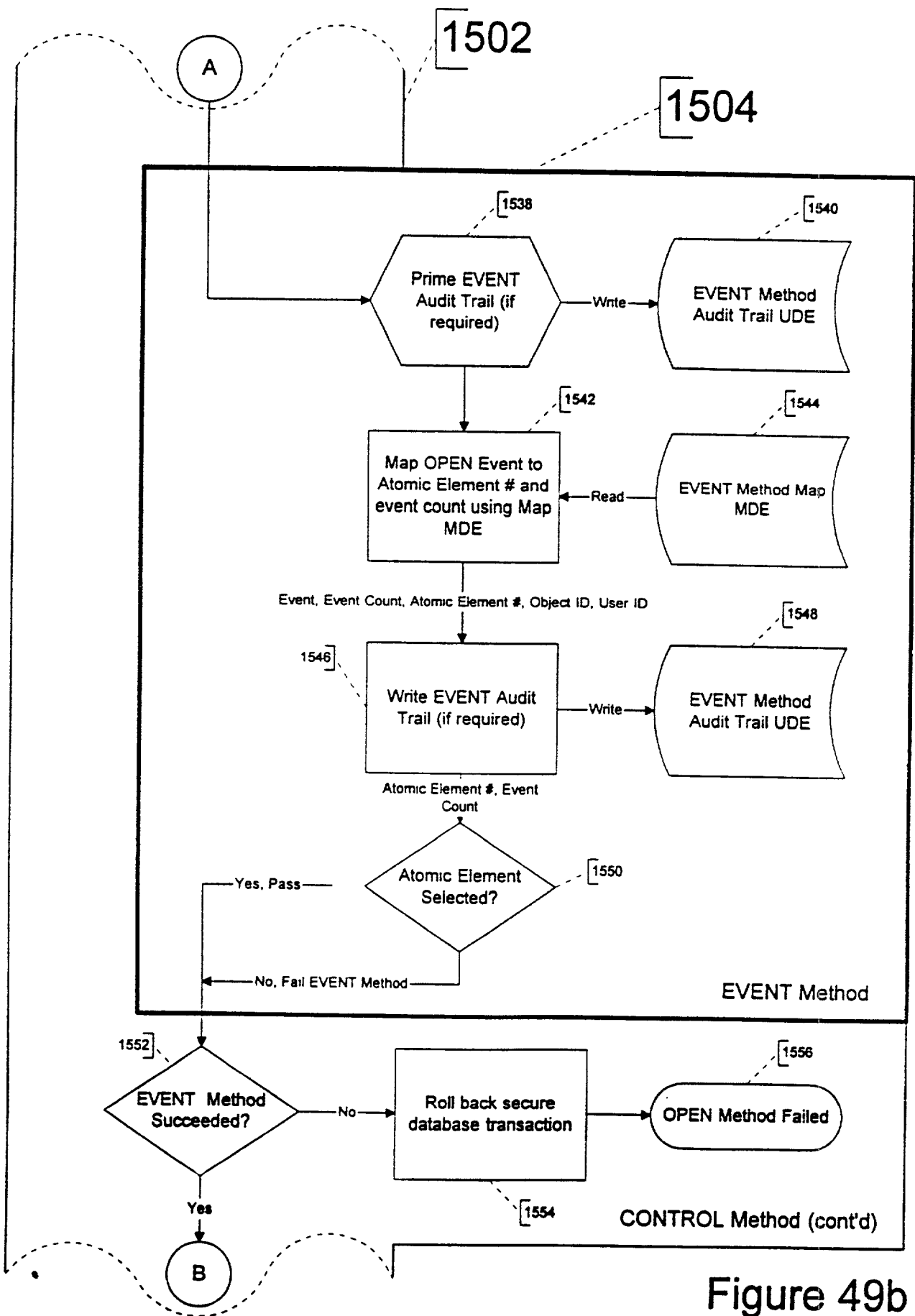


Figure 49b

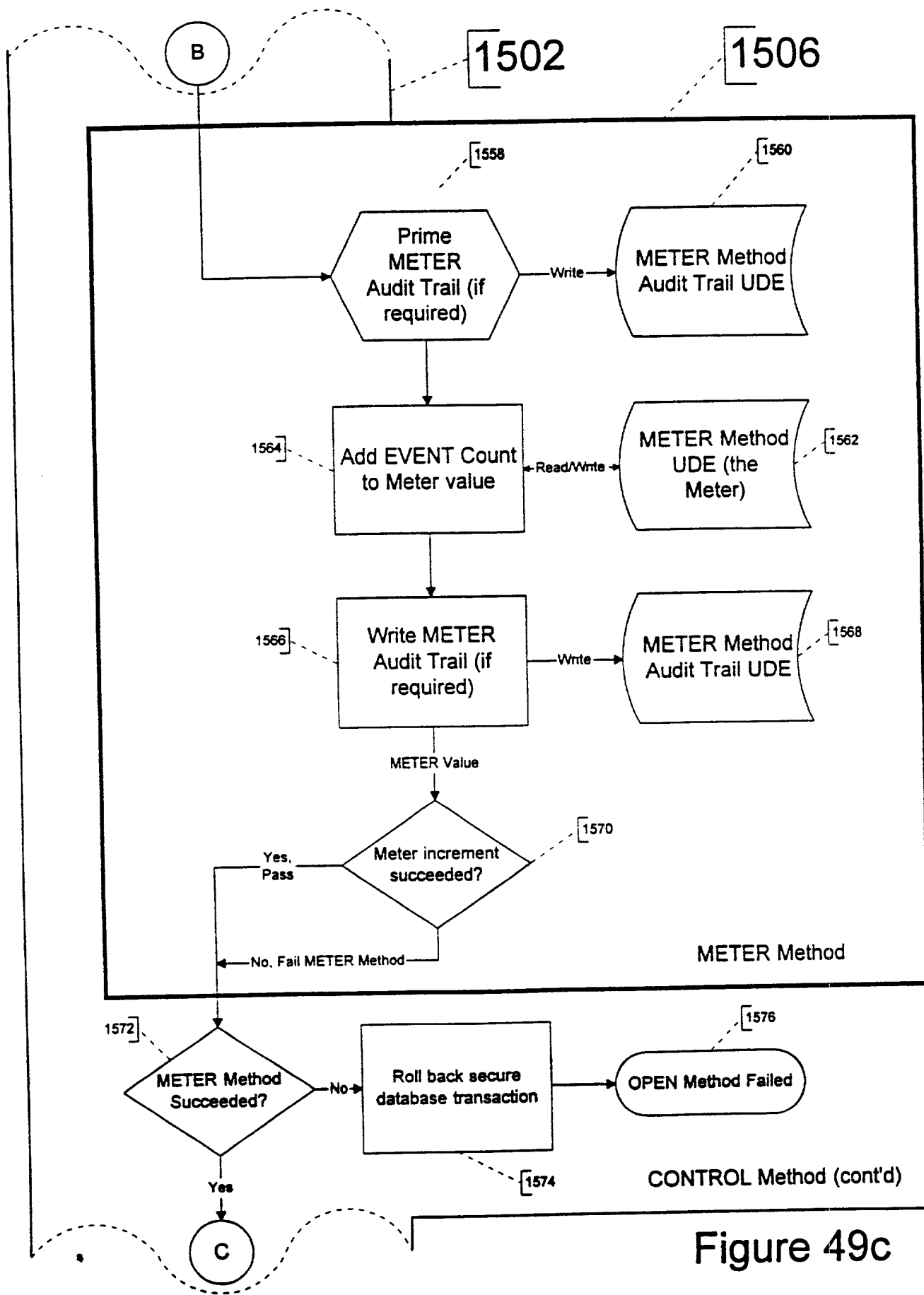


Figure 49c

FIG. 49d is a flowchart illustrating a BILLING Method and a CONTROL Method (cont'd). The flowchart is divided into two main sections: the BILLING Method and the CONTROL Method (cont'd). The BILLING Method section includes steps for writing a Prime BILLING Audit Trail, reading a BILLING Method Map MDE (Price list), mapping atomic elements to billing amounts, writing a BILLING Audit Trail, and selecting a billing amount. The CONTROL Method (cont'd) section includes a decision on whether the BILLING Method succeeded. If it failed, it rolls back the secure database transaction and outputs OPEN Method Failed. If it succeeded, it proceeds to step D.

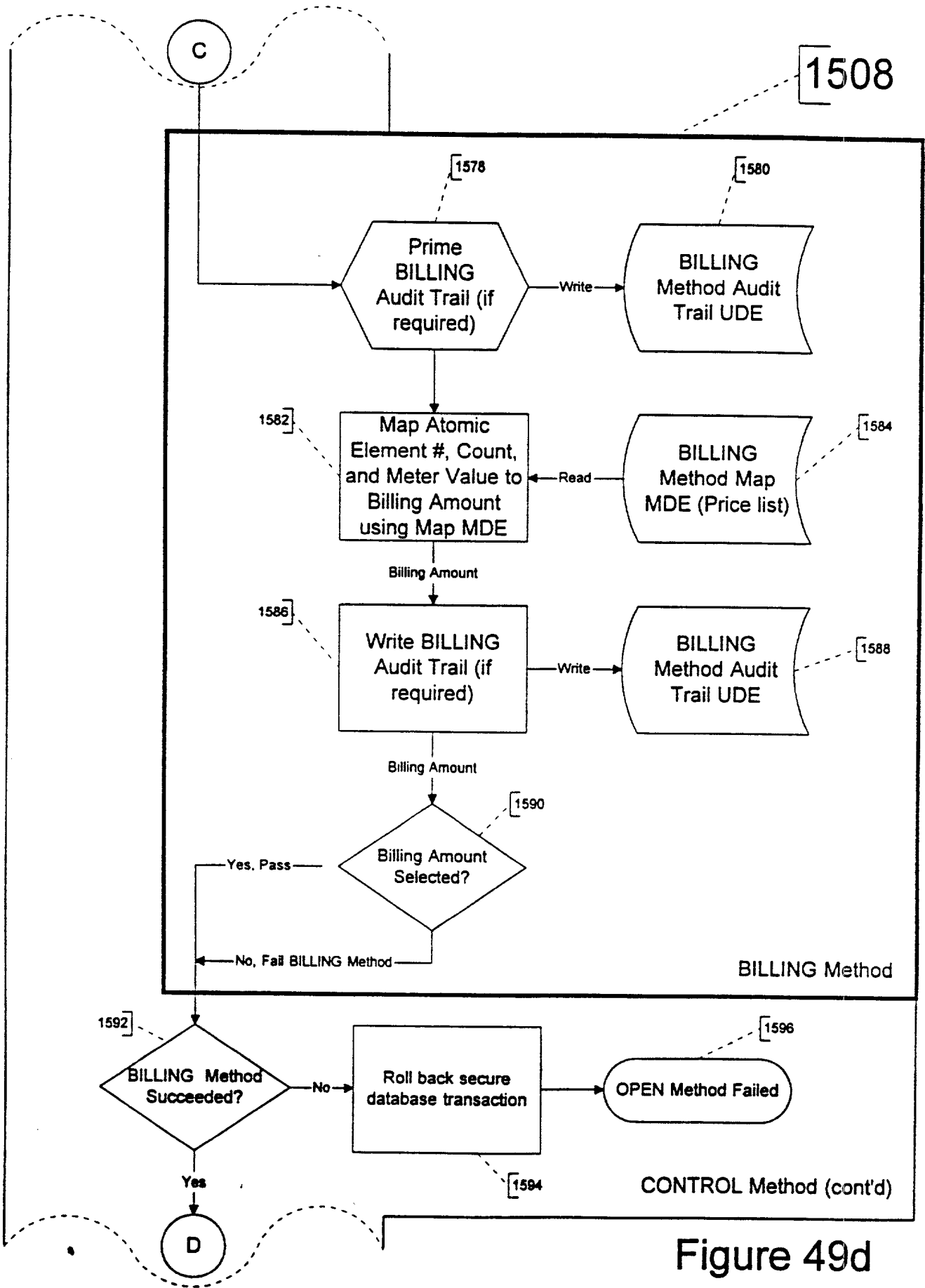


Figure 49d

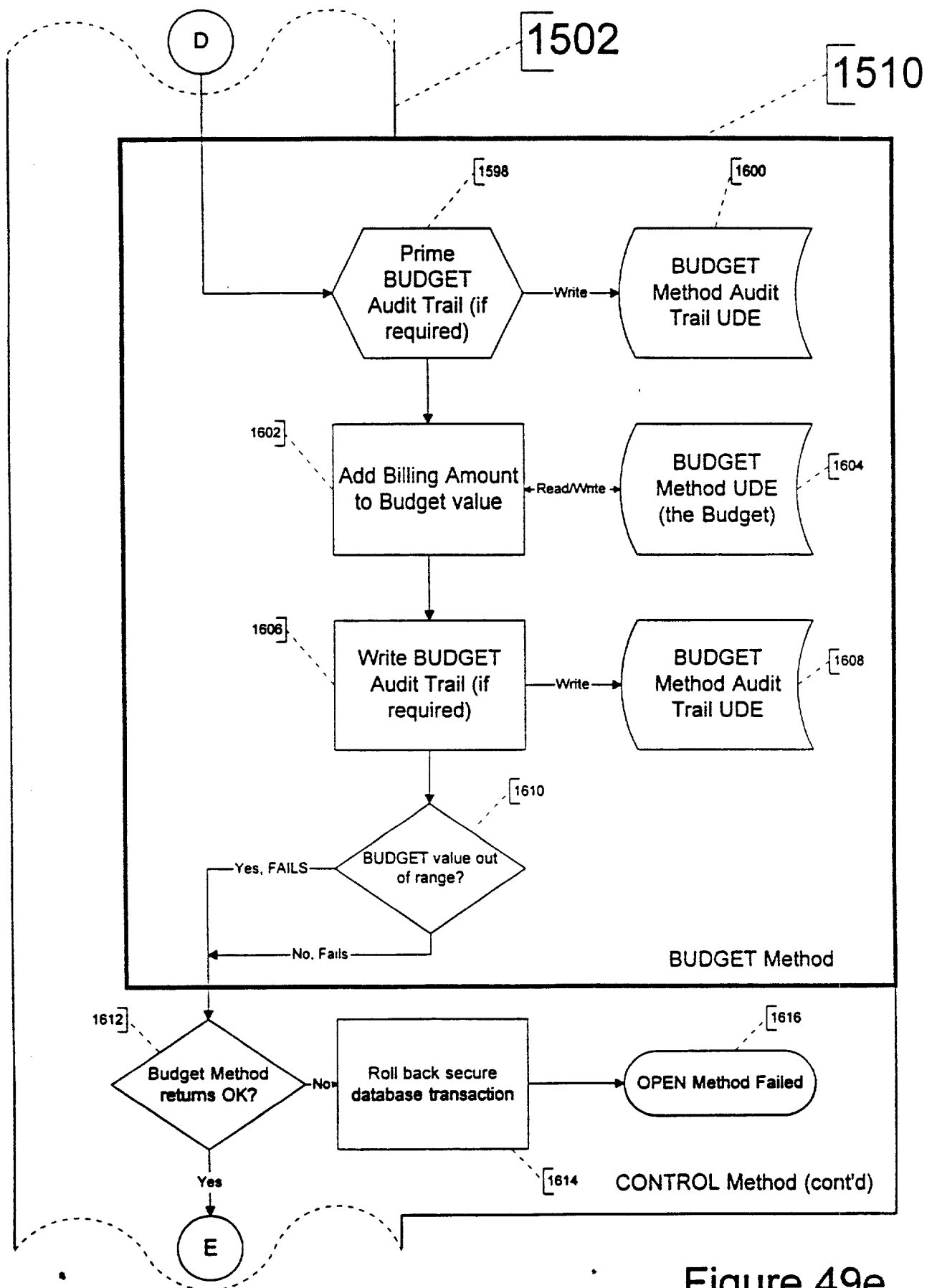


Figure 49e

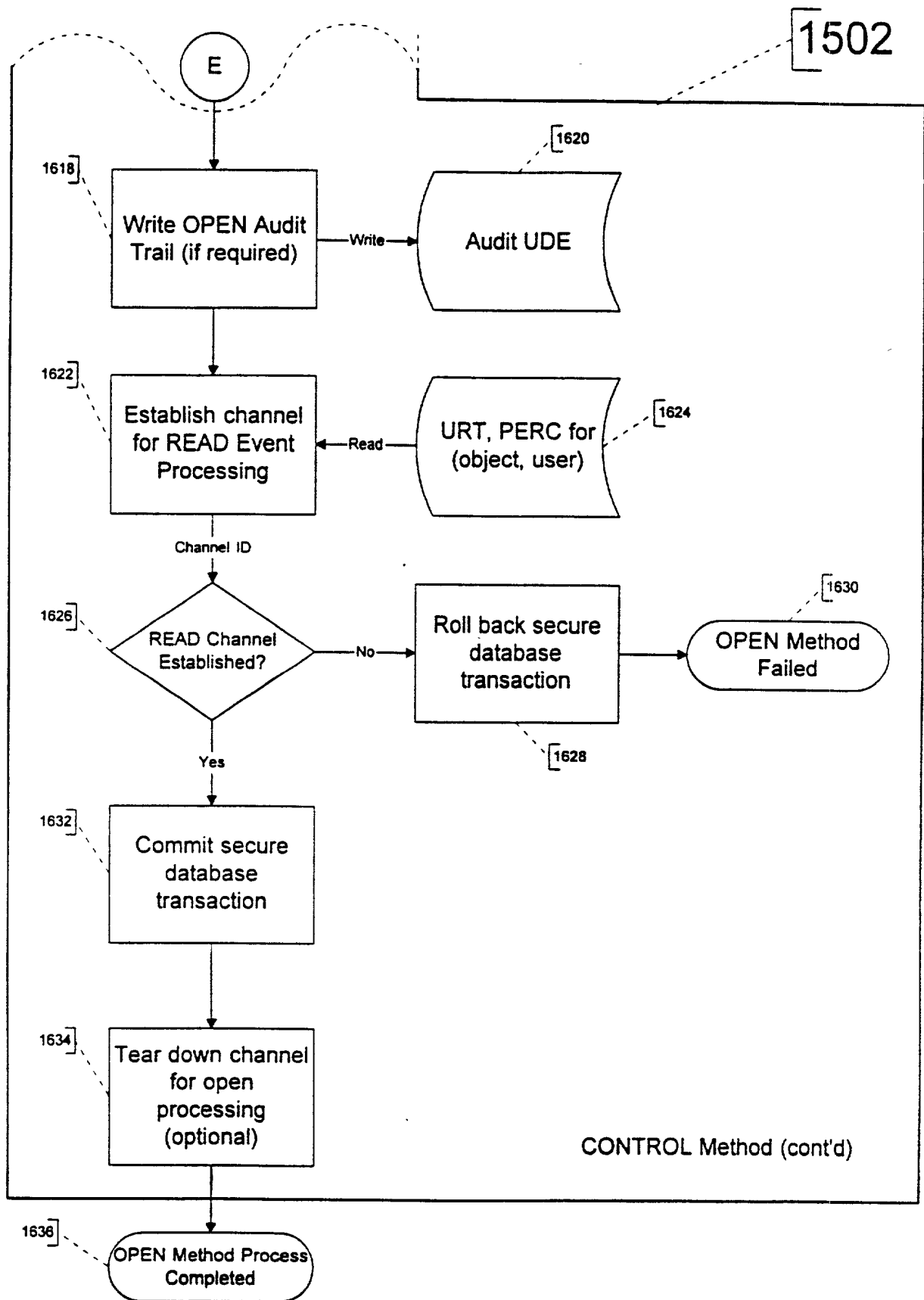


Figure 49f

READ Method Use Process Flow

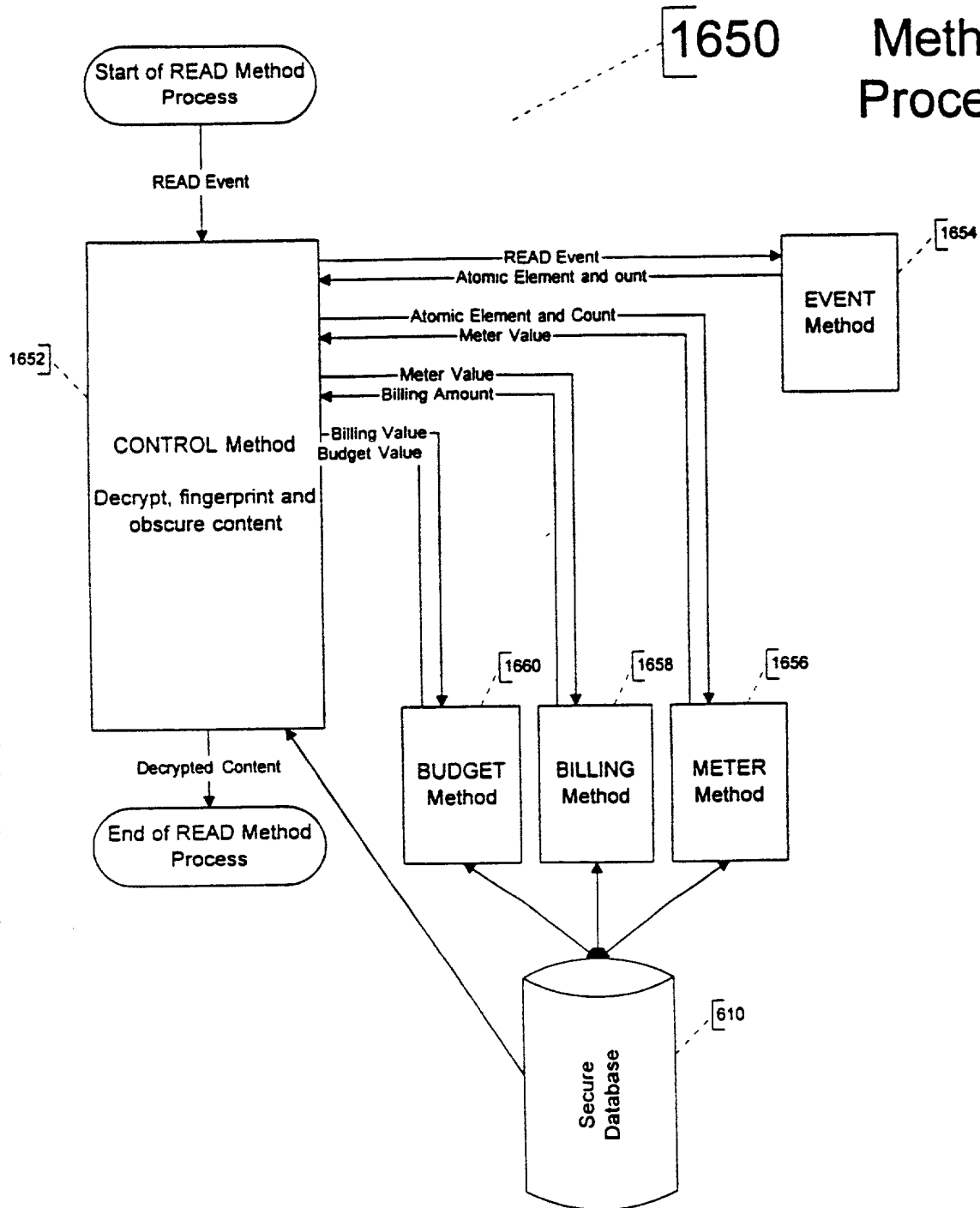


Figure 50

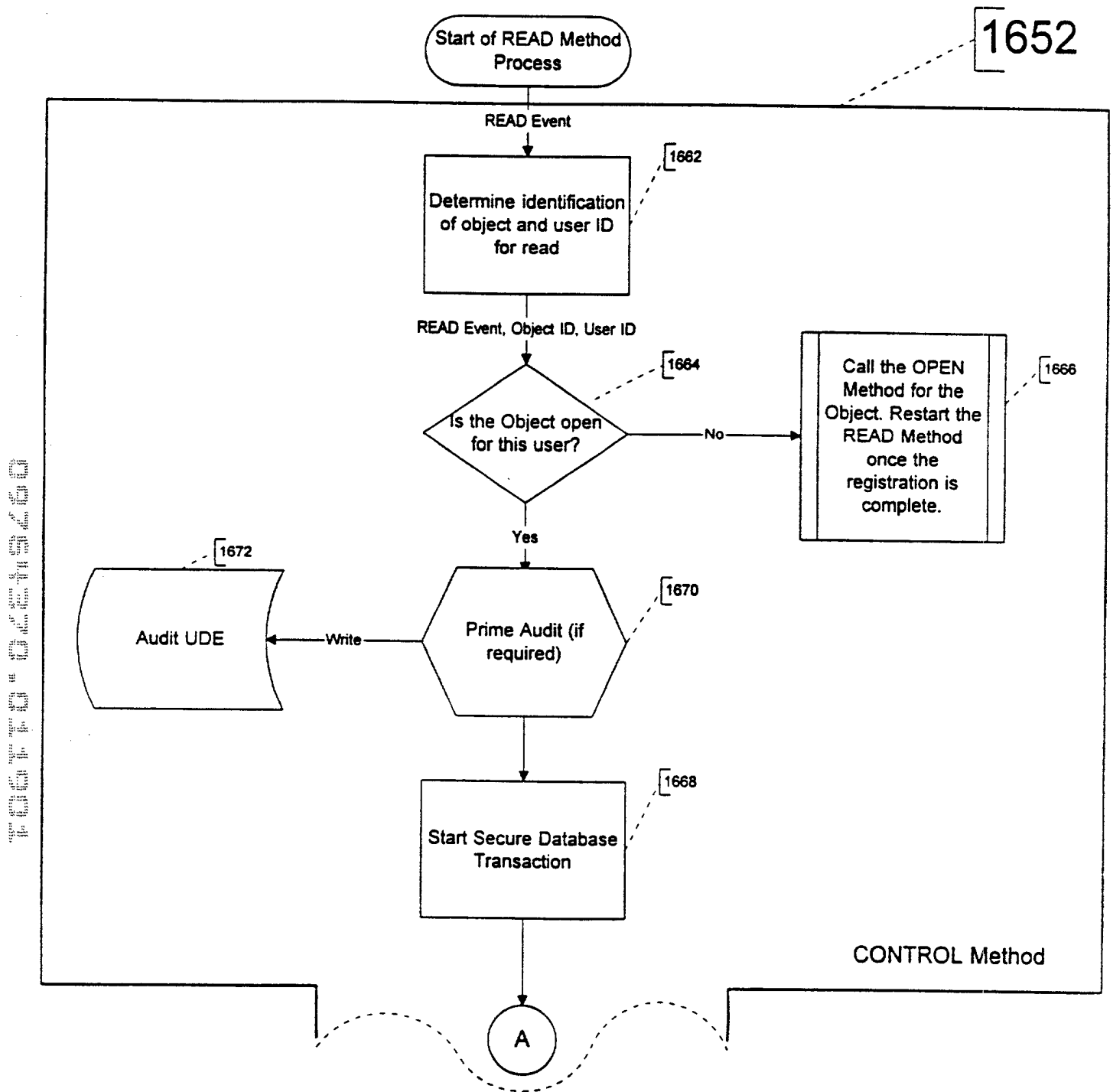


Figure 50a

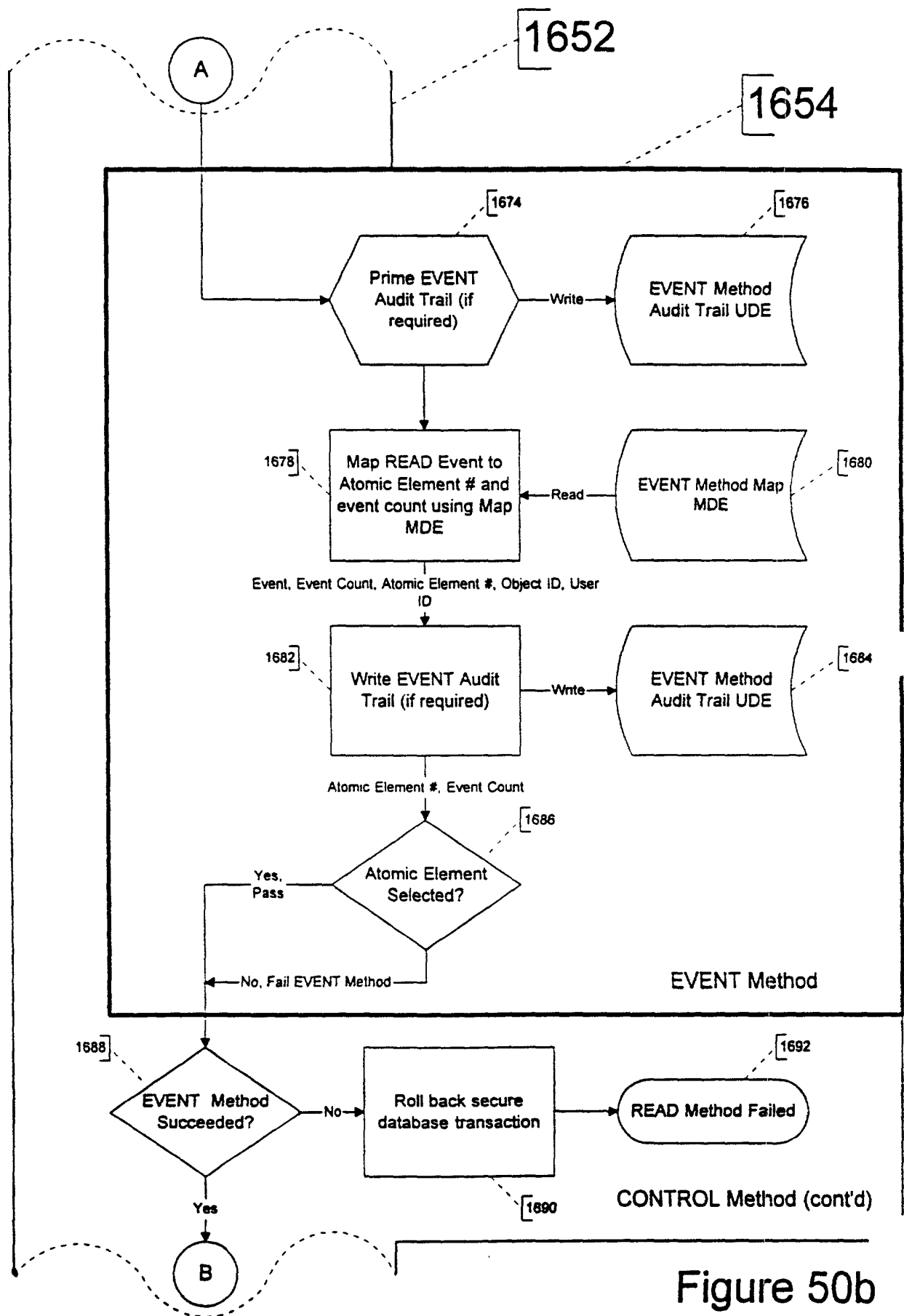


Figure 50b

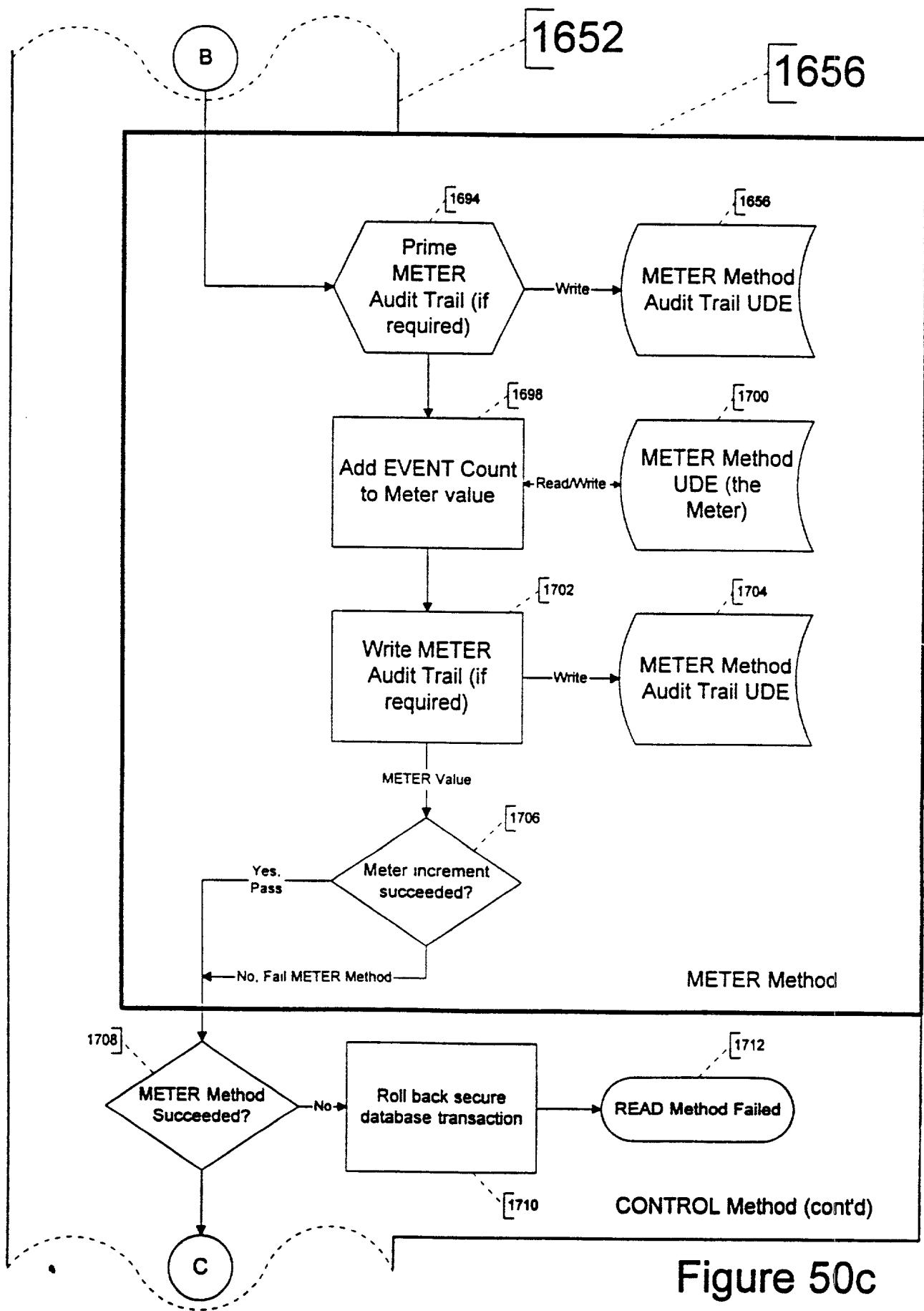


Figure 50c

Page 10 of 10

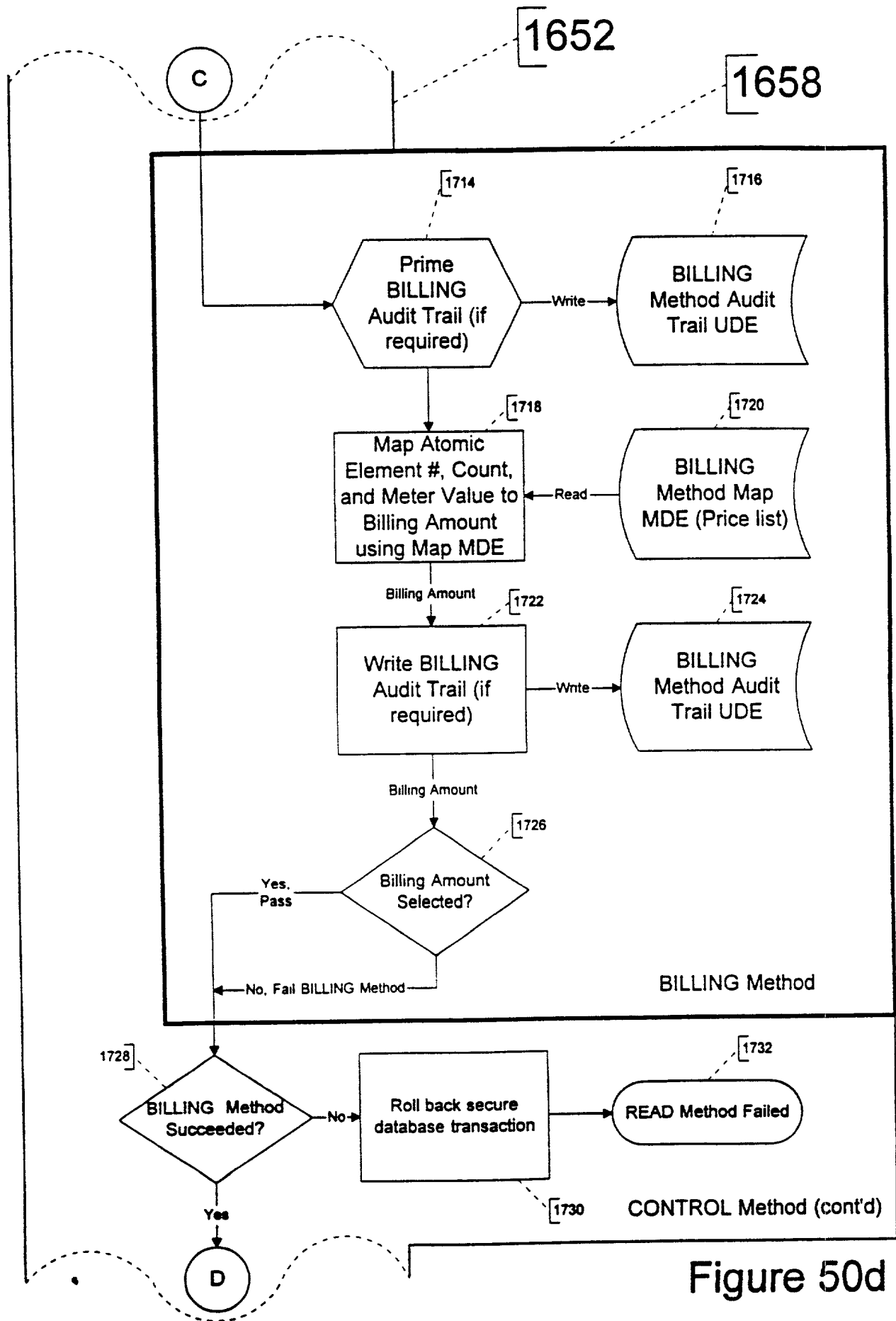


Figure 50d

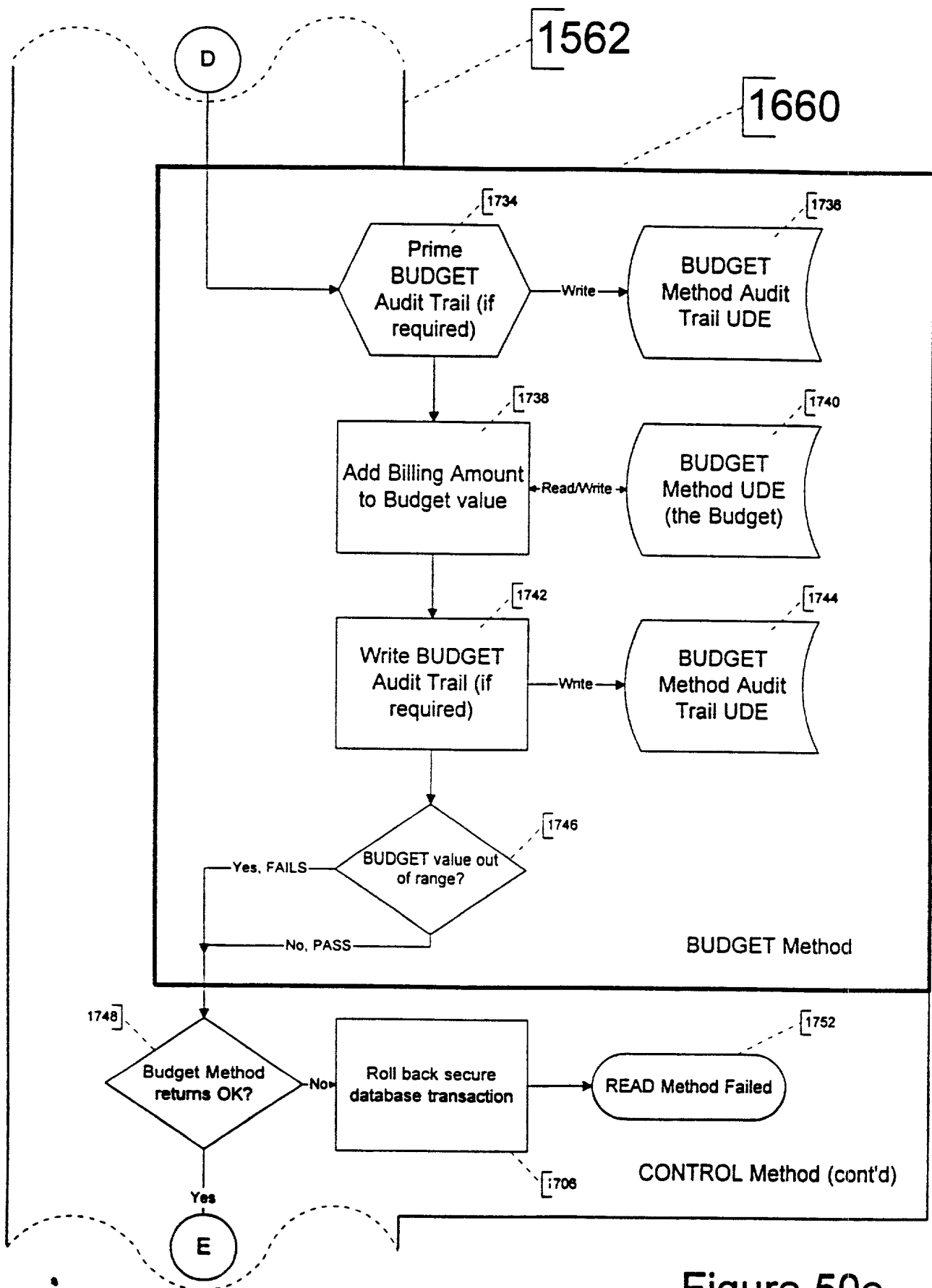
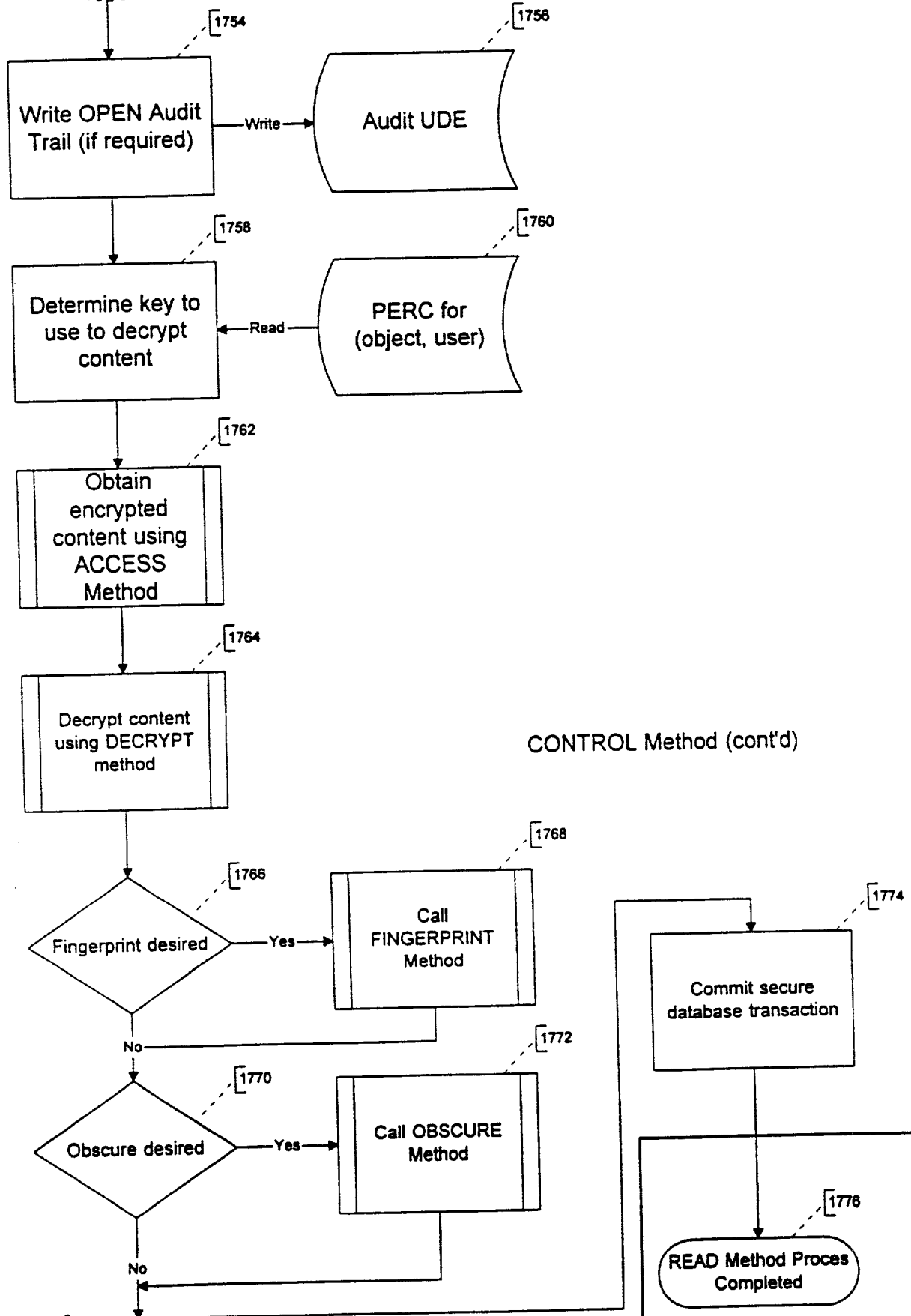


Figure 50e



WRITE Method Use Process Flow

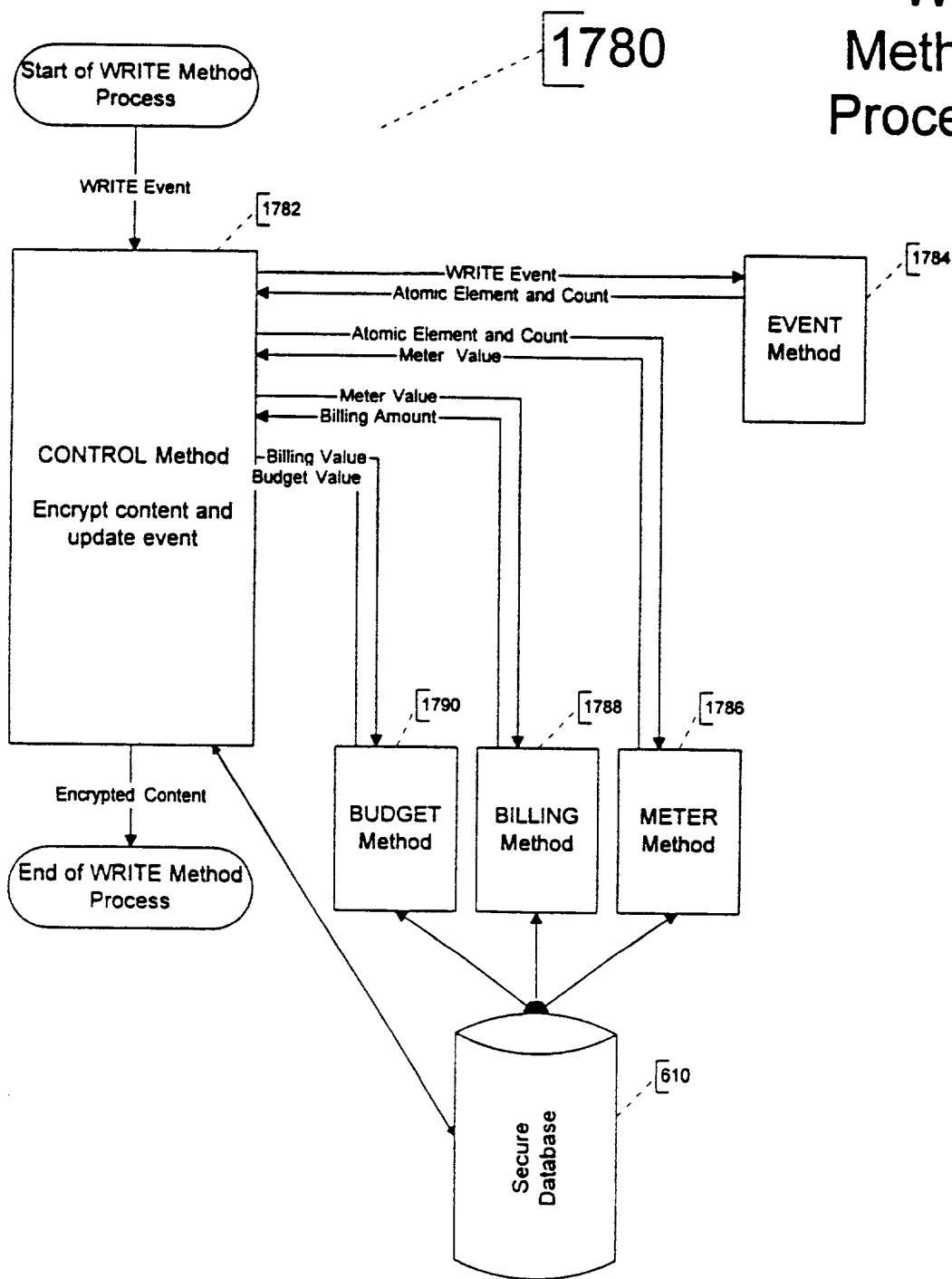


Figure 51

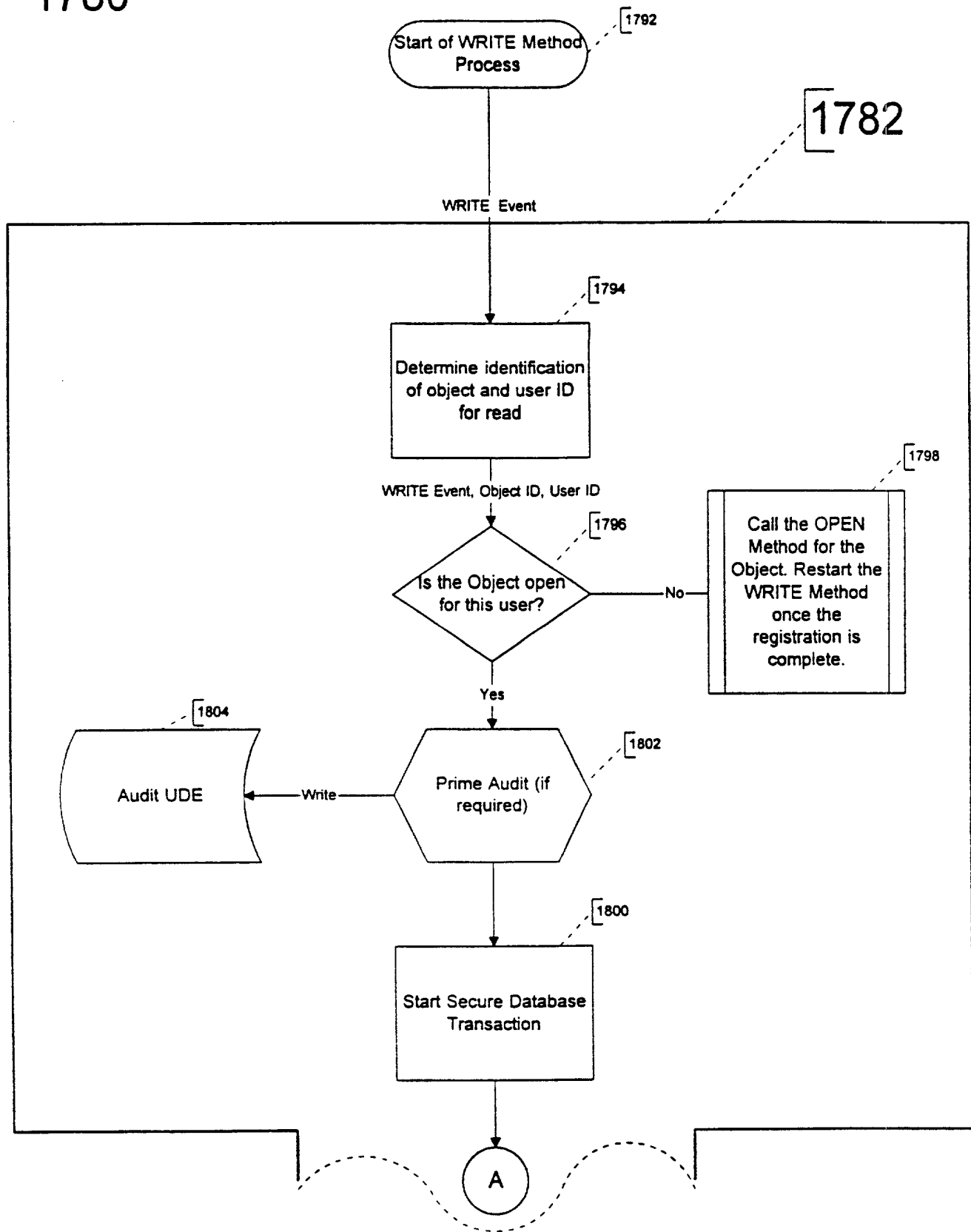


Figure 51a

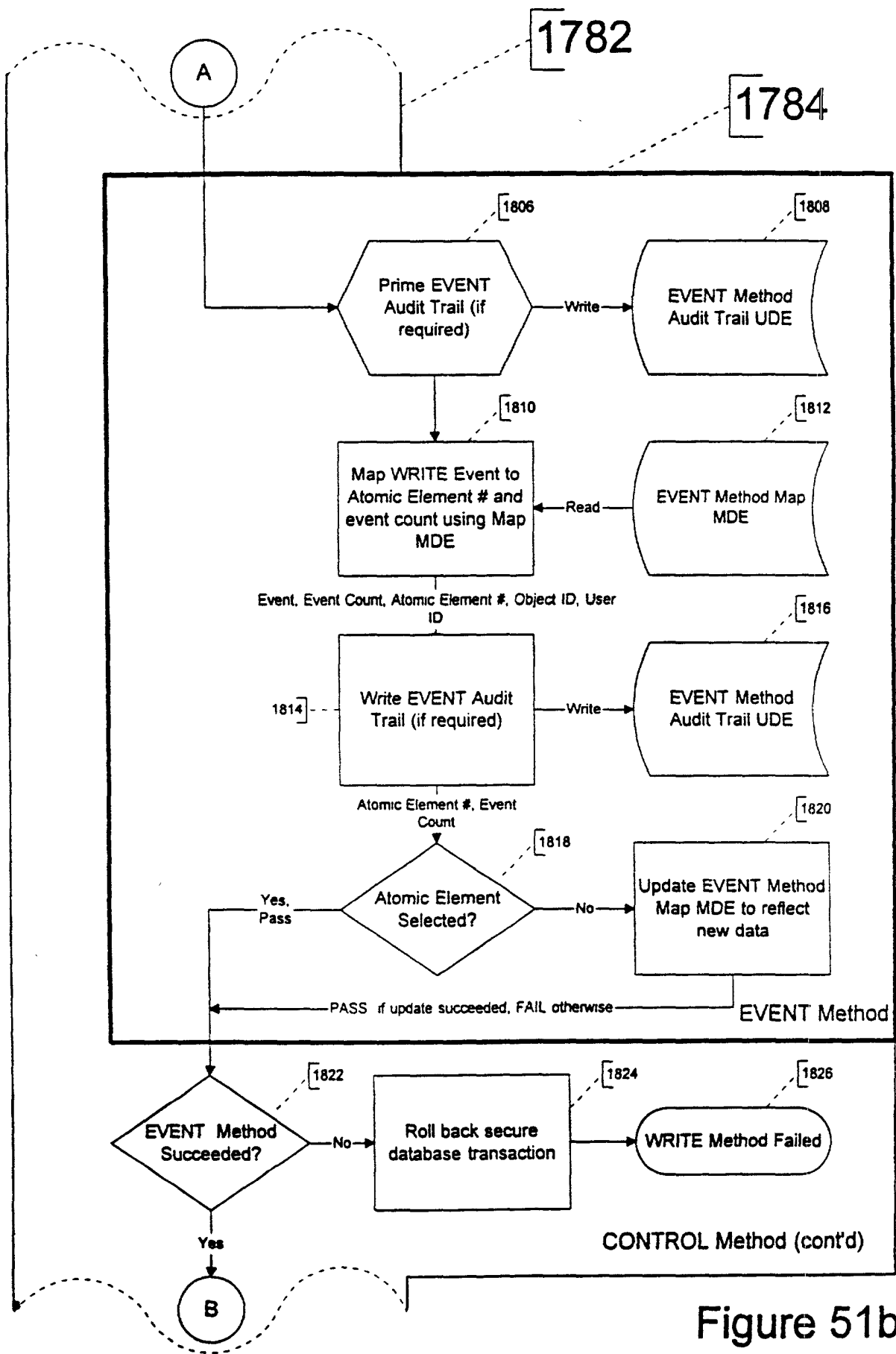


Figure 51b

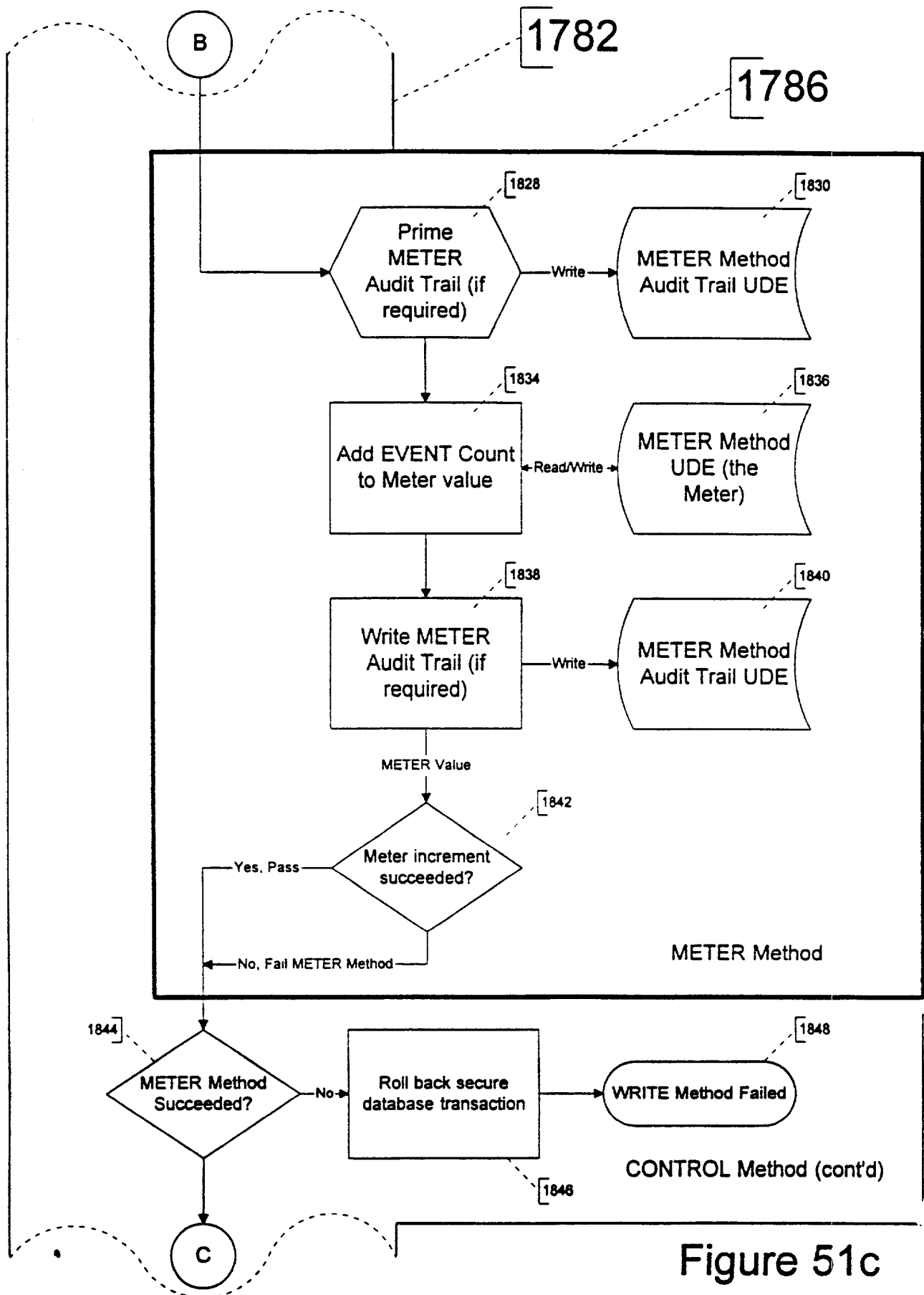


Figure 51c

```

graph TD
    C((C)) --> 1850{{Prime BILLING Audit Trail (if required)}}
    1850 -- Write --> 1852[BILLING Method Audit Trail UDE]
    1850 --> 1854[Map Atomic Element #, Count, and Meter Value to Billing Amount using Map MDE]
    1856[BILLING Method Map MDE (Price list)] -- Read --> 1854
    1854 -- Billing Amount --> 1858[Write BILLING Audit Trail (if required)]
    1858 -- Write --> 1860[BILLING Method Audit Trail UDE]
    1858 -- Billing Amount --> 1862{Billing Amount Selected?}
    1862 -- "Yes, Pass" --> 1864{BILLING Method Succeeded?}
    1862 -- "No, Fail BILLING Method" --> 1864
    1864 -- No --> 1866[Roll back secure database transaction]
    1866 --> 1868([WRITE Method Failed])
    1864 -- Yes --> D((D))
    D --> 1782
    1782 --> 1788

```

Figure 51d

Figure 51d

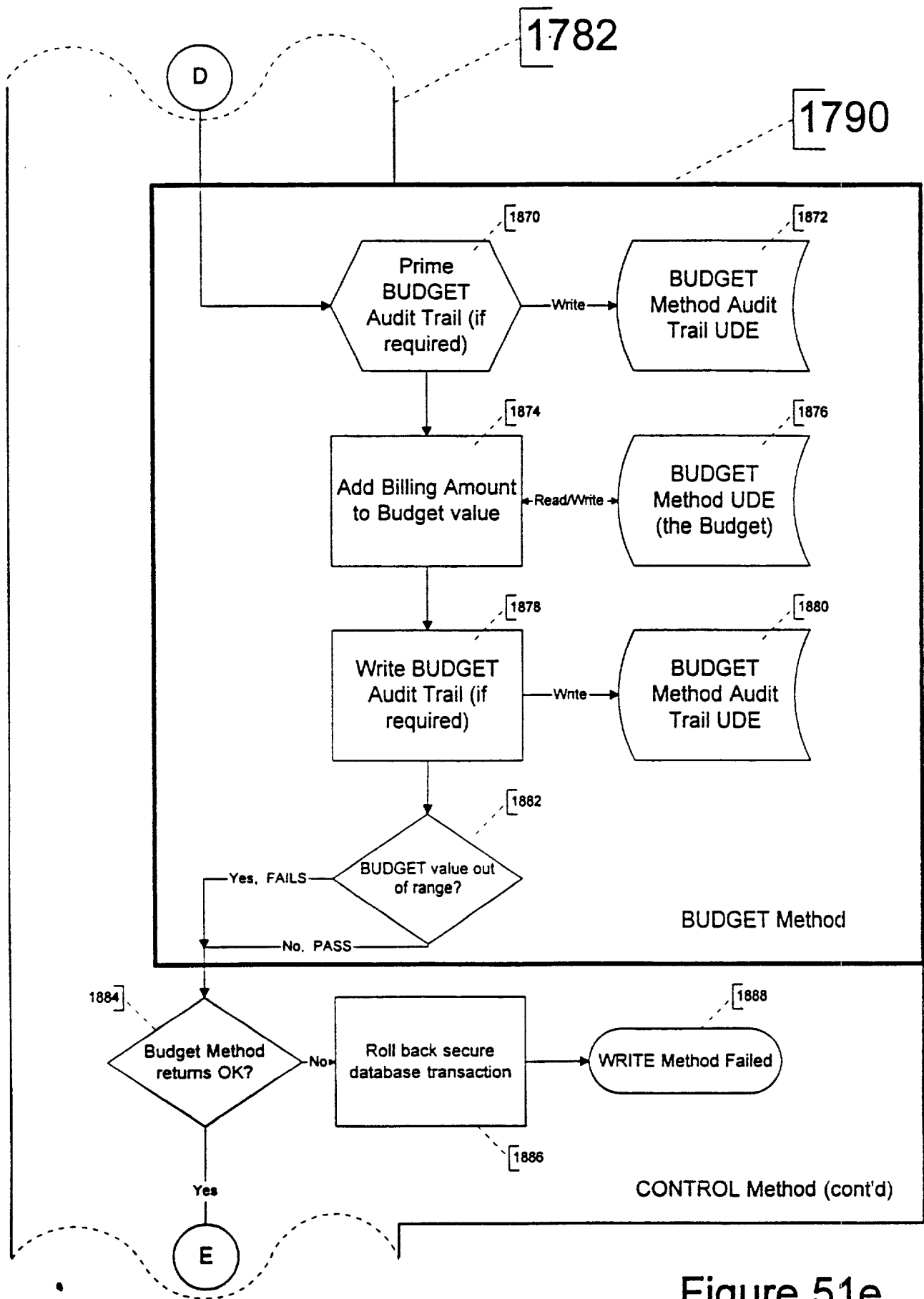
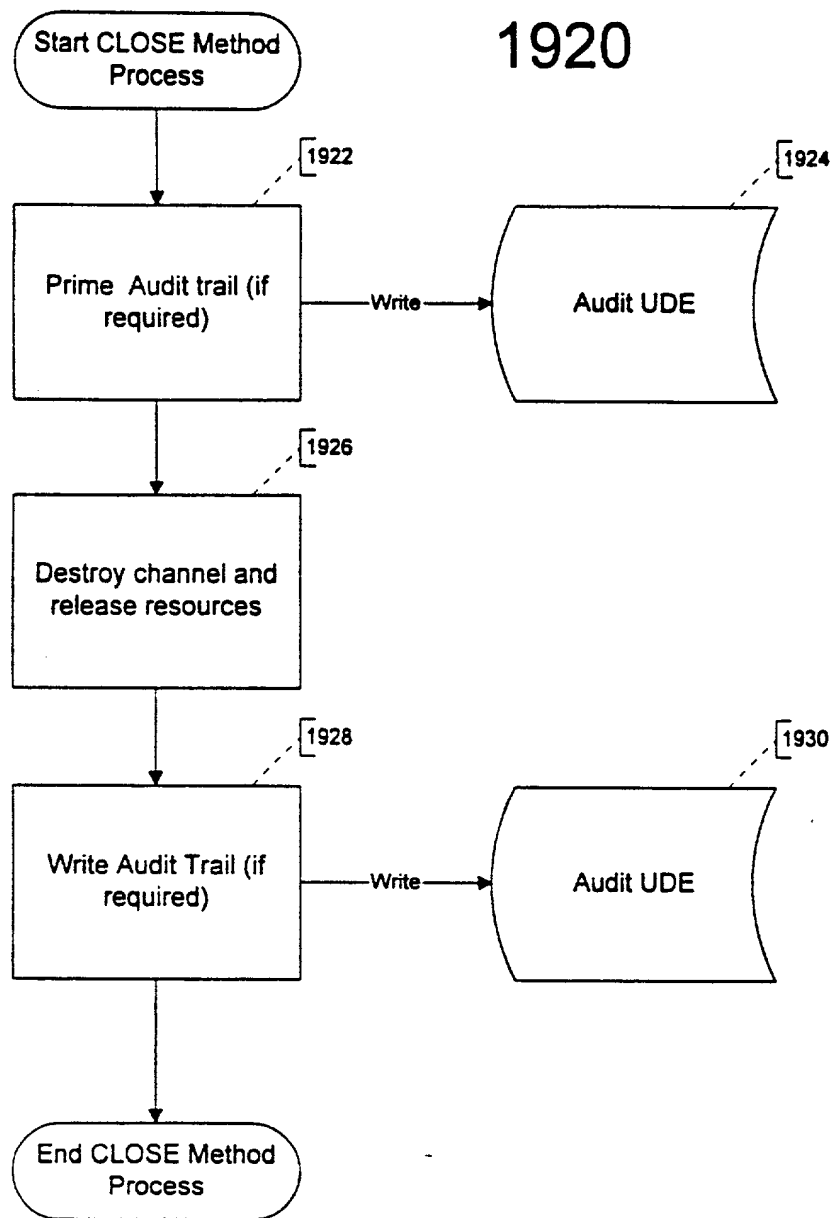


Figure 51e



CLOSE Method Process Flow

Figure 52

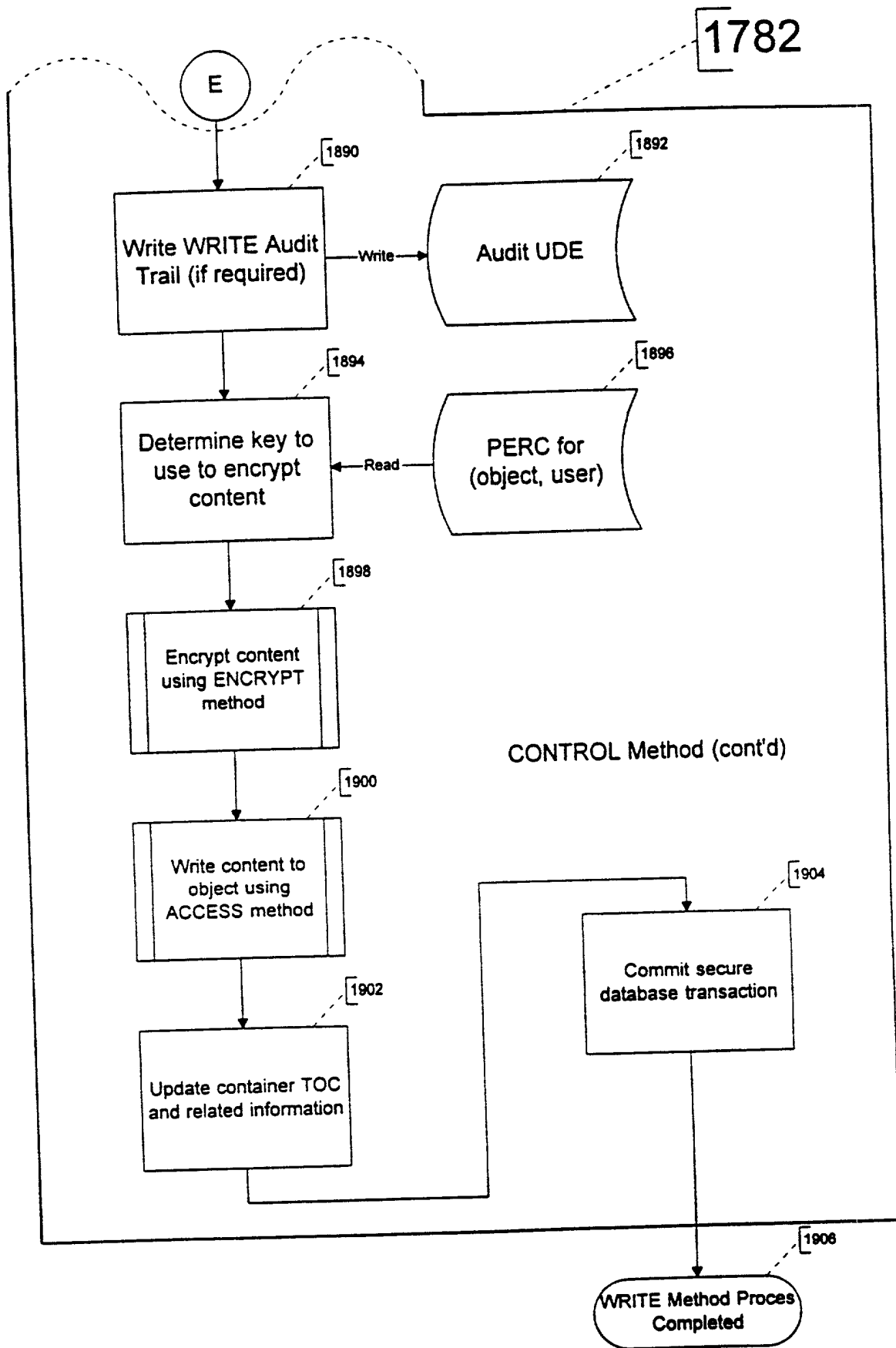


Figure 51f

[illegible]

— *Journal of the American Medical Association*, 1997

EVENT Method Process Flows

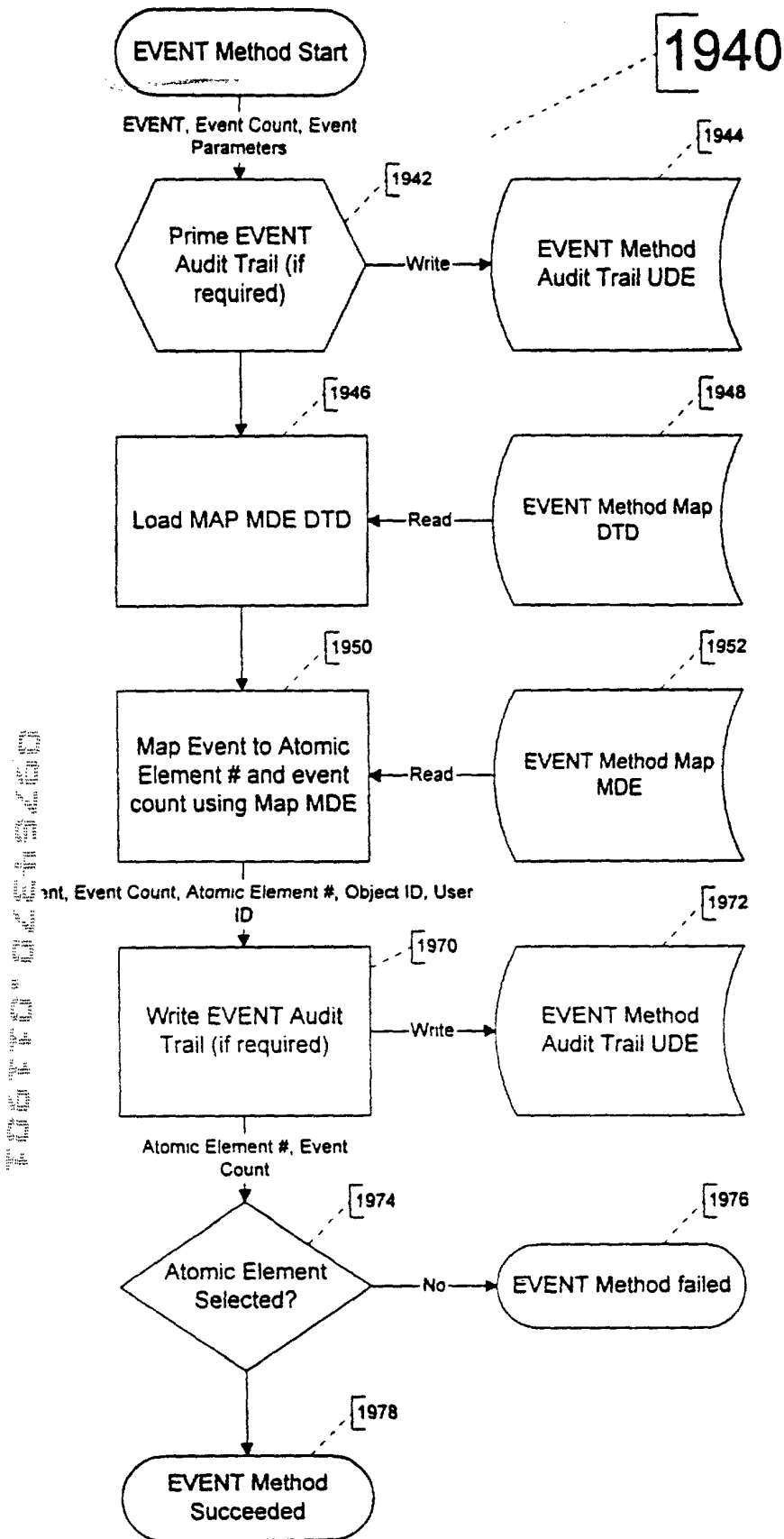


Figure 53a

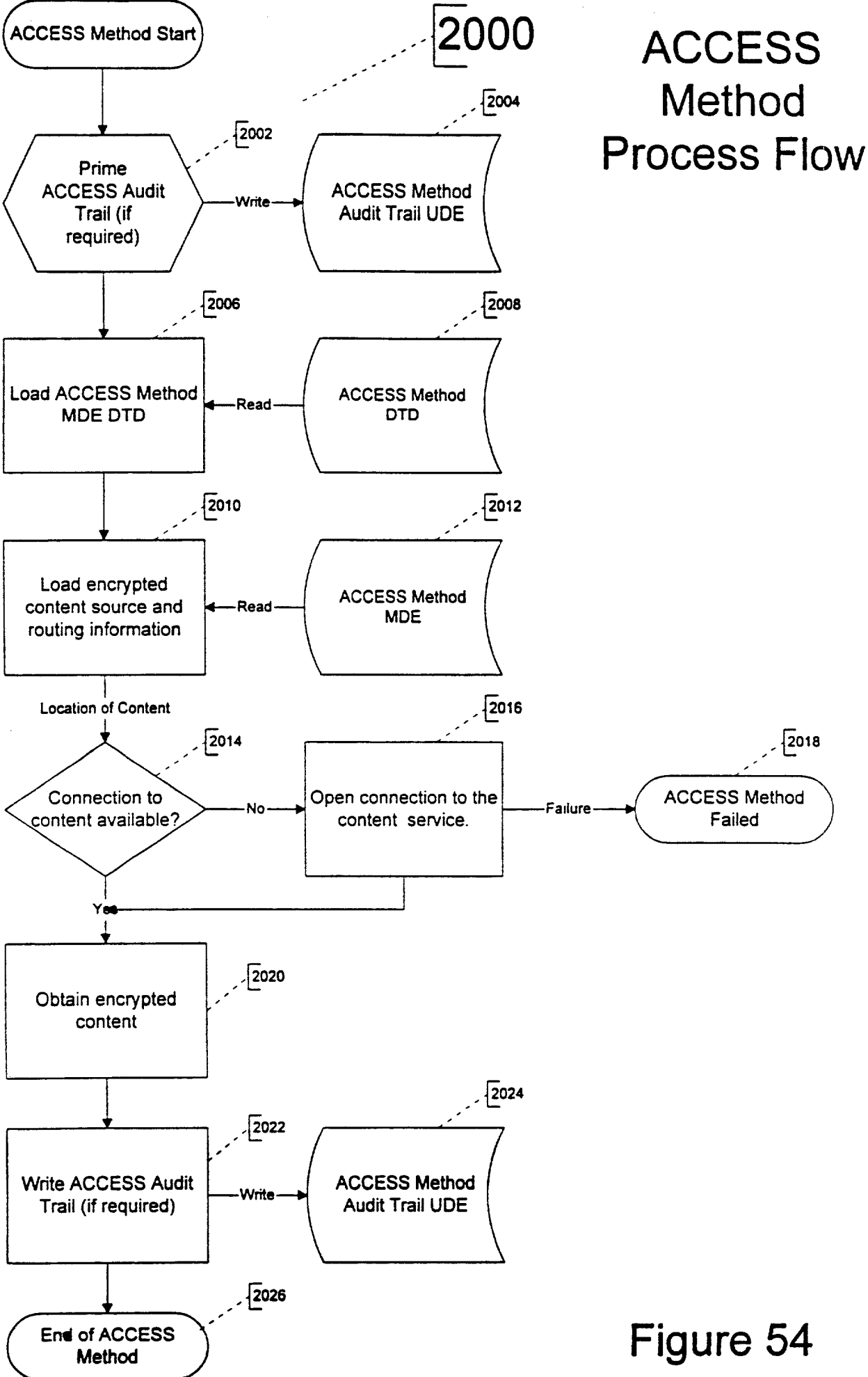


Figure 54

BILLING Method Process Flows

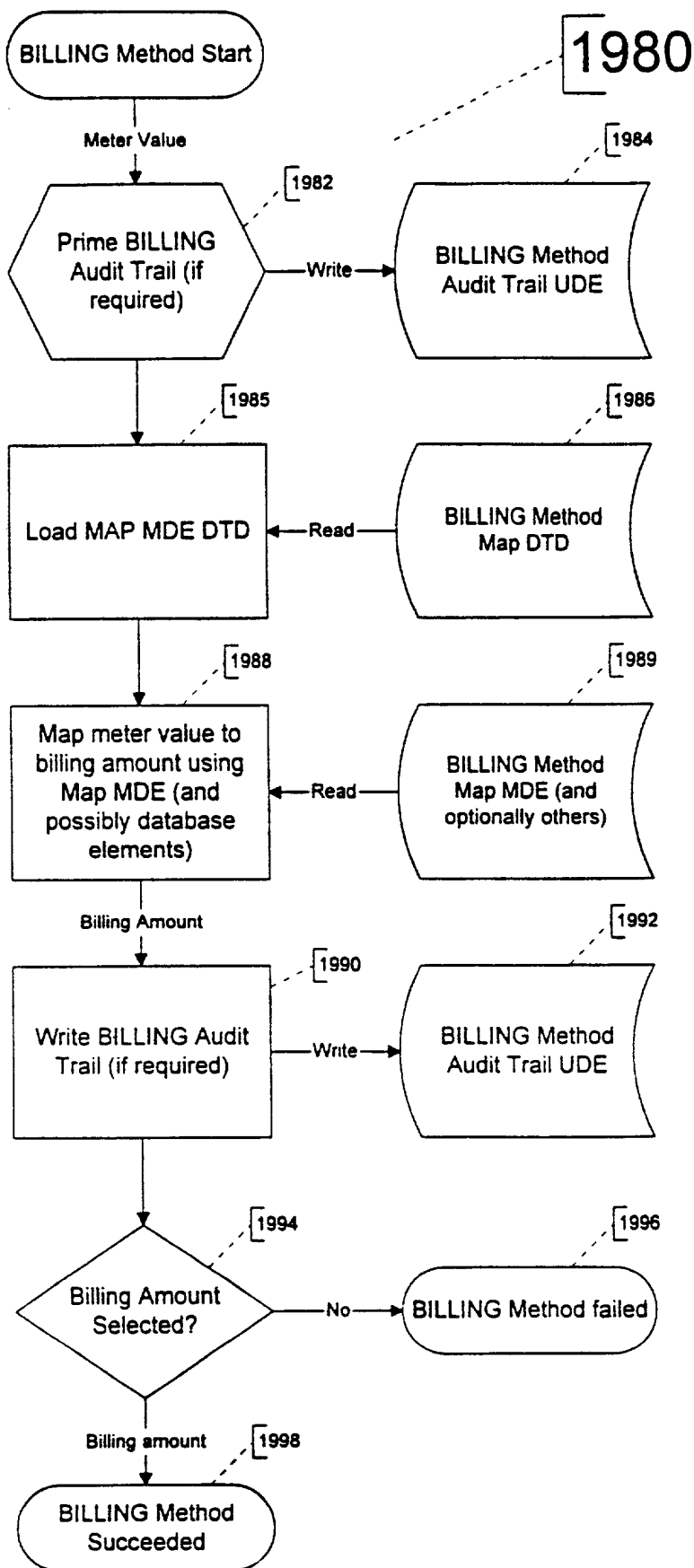


Figure 53c

ENCRYPT Method Process Flow

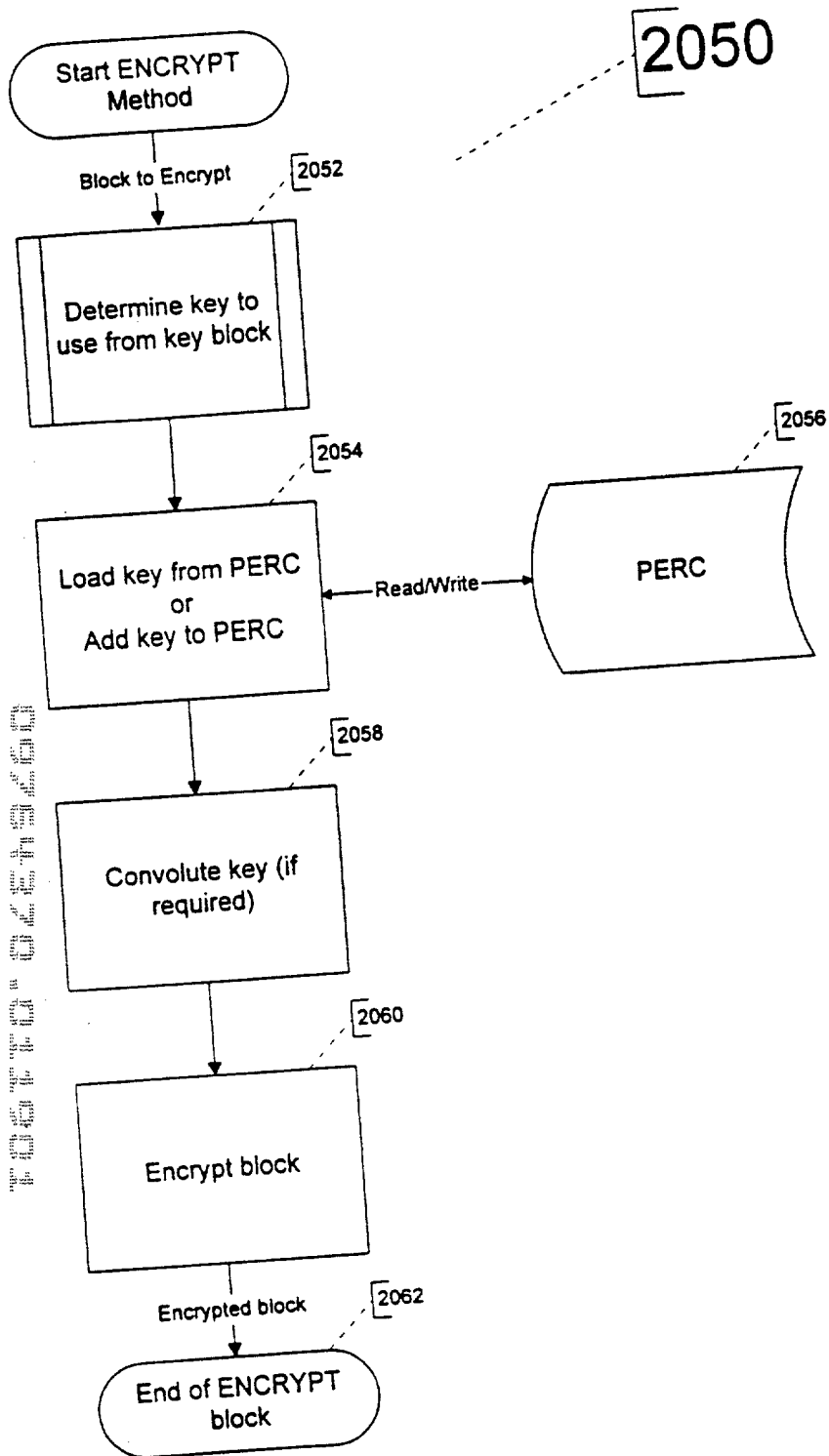


Figure 55b

DECRYPT Method Process Flow

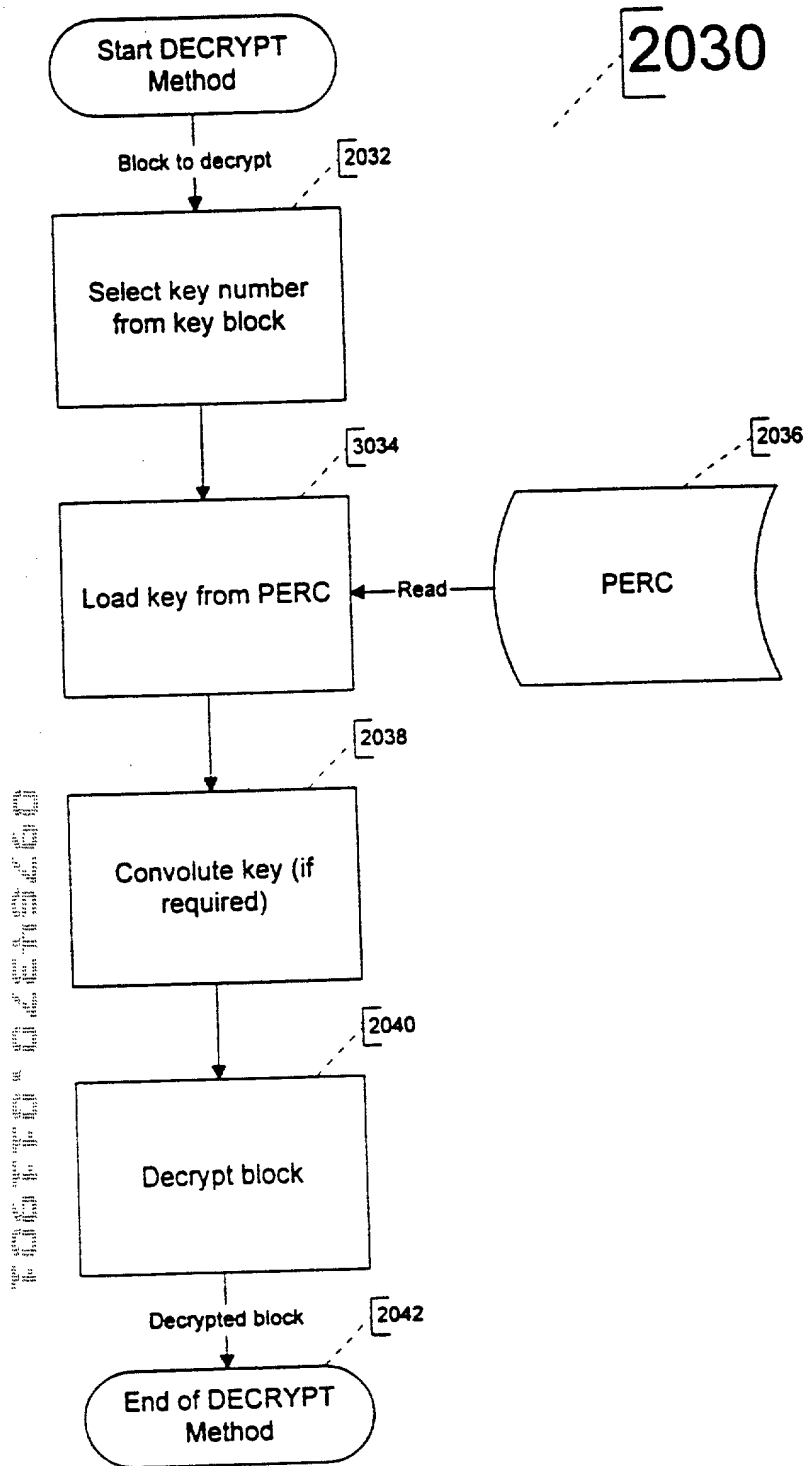


Figure 55a

EXTRACT Method Process Flow

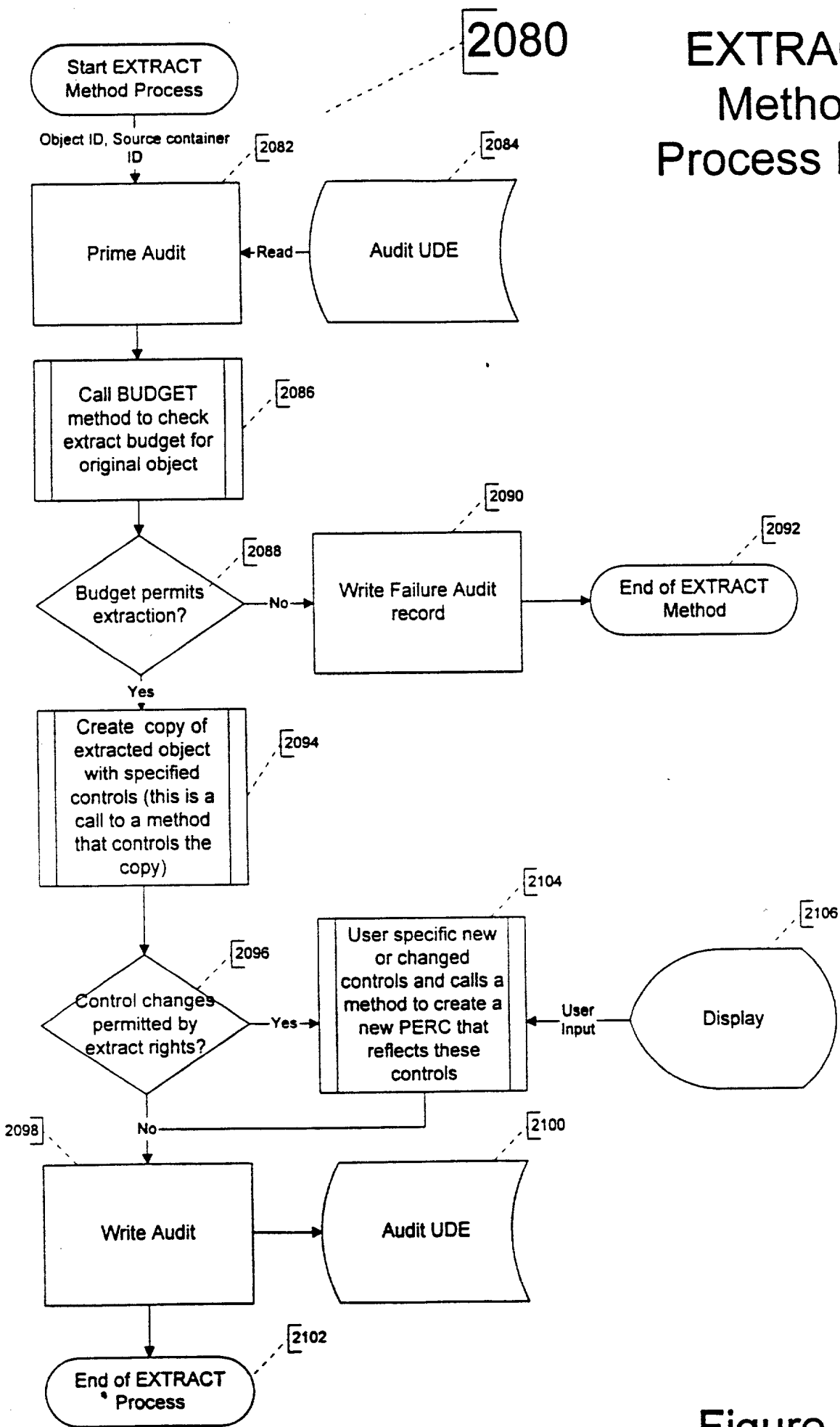


Figure 57a

CONTENT Method Process Flow

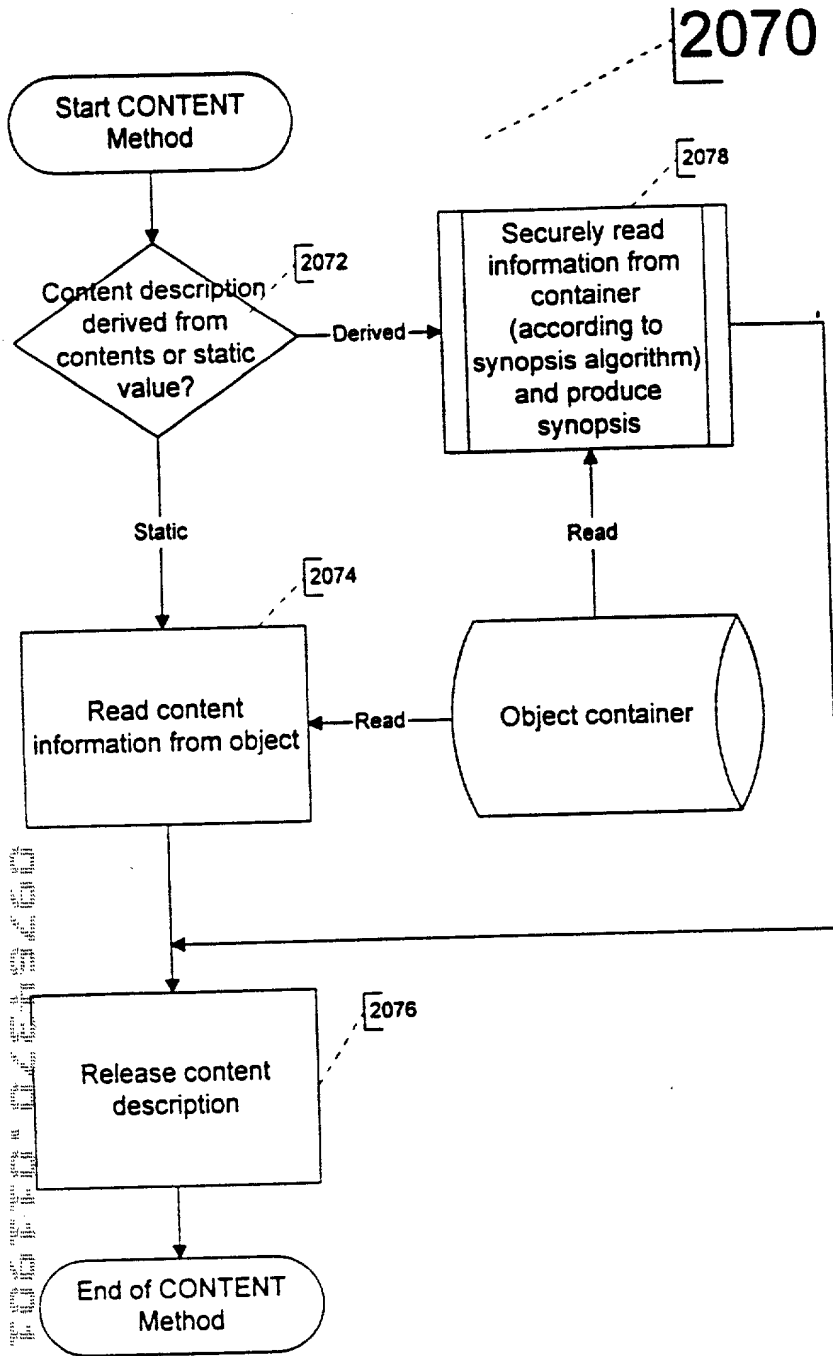
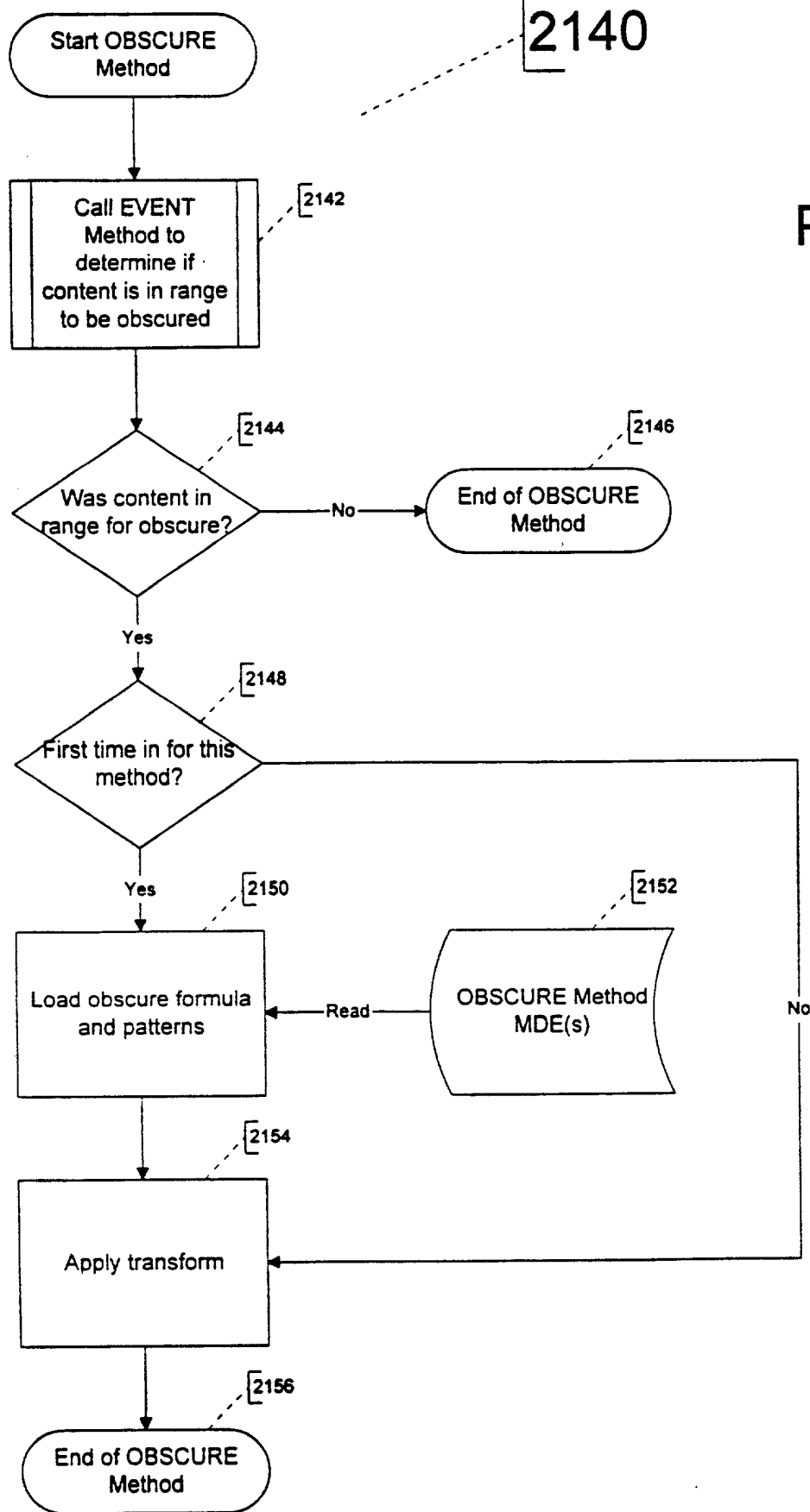


Figure 56



OBSCURE Method Process Flow

Figure 58a

EMBED Method Process Flow

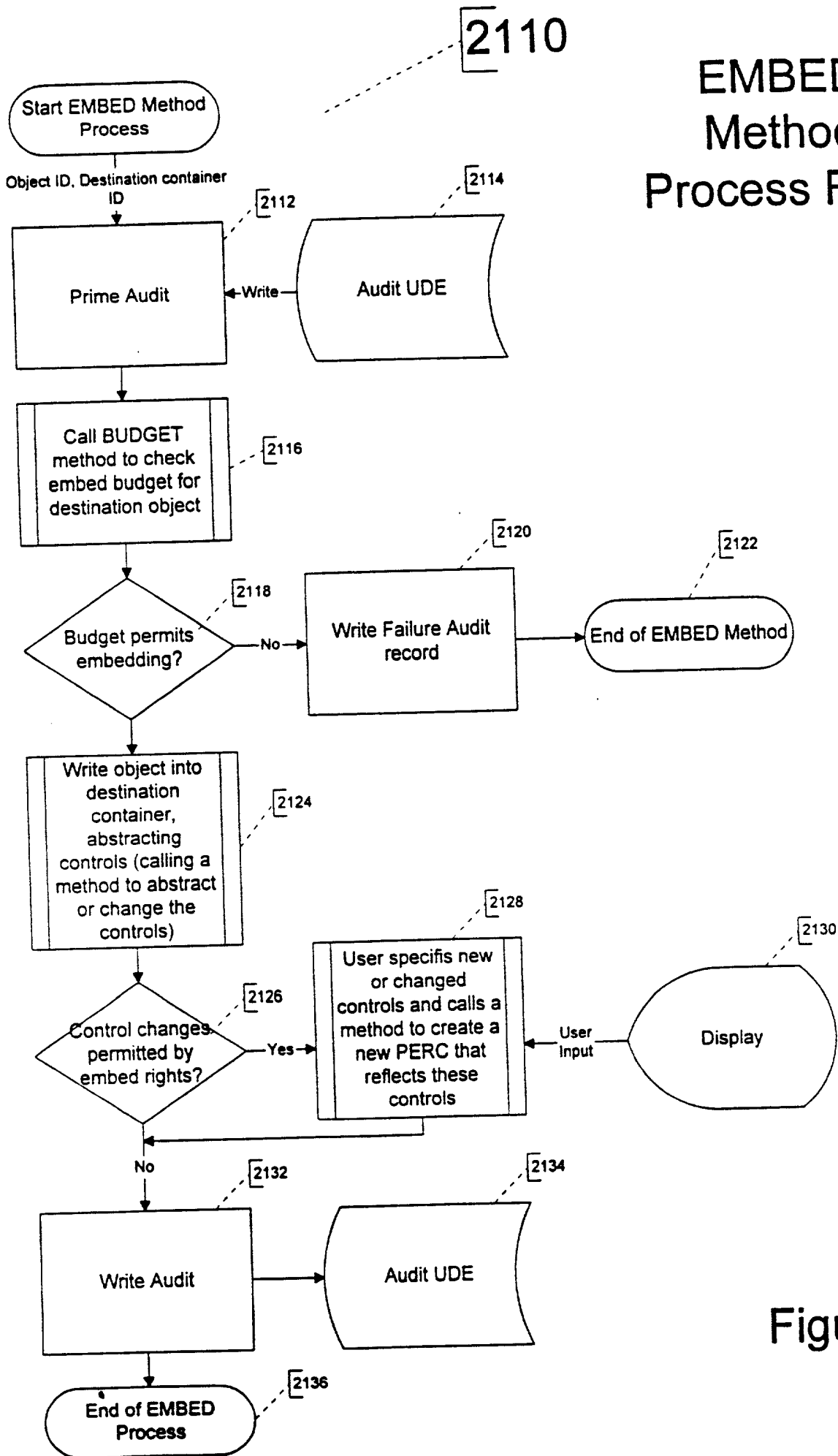


Figure 57b

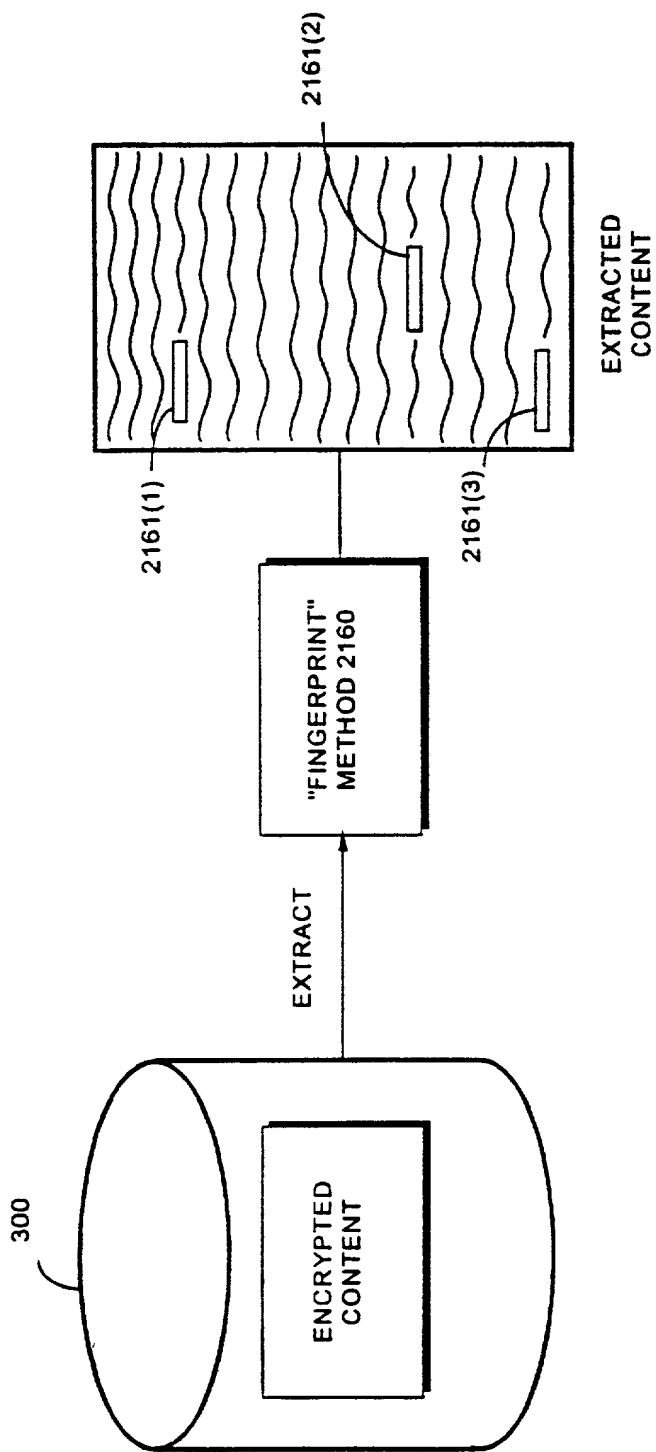


FIG. 58C

2160

FINGERPRINT Method Process Flow

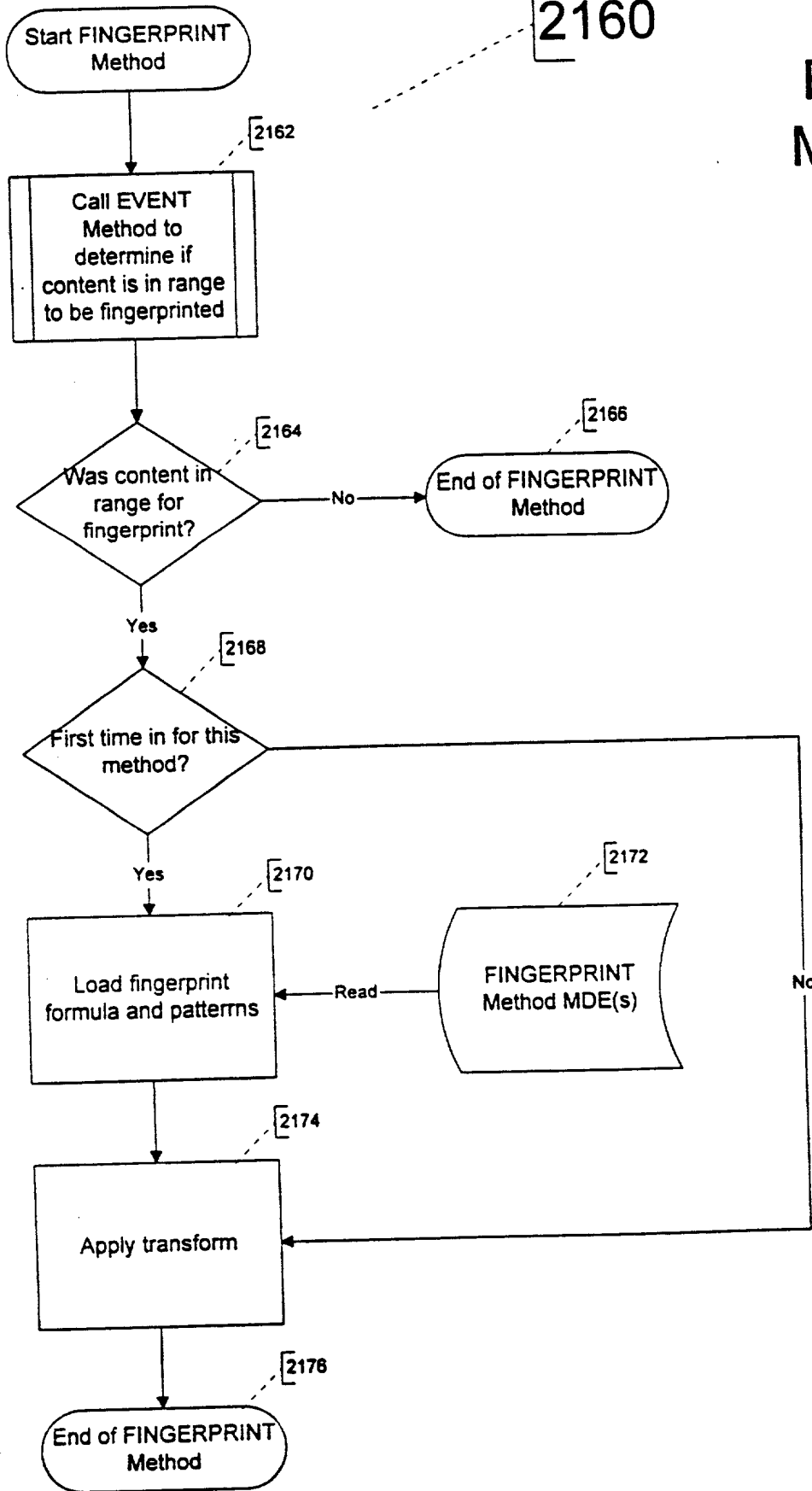


Figure 58b

PANIC Method Process Flow

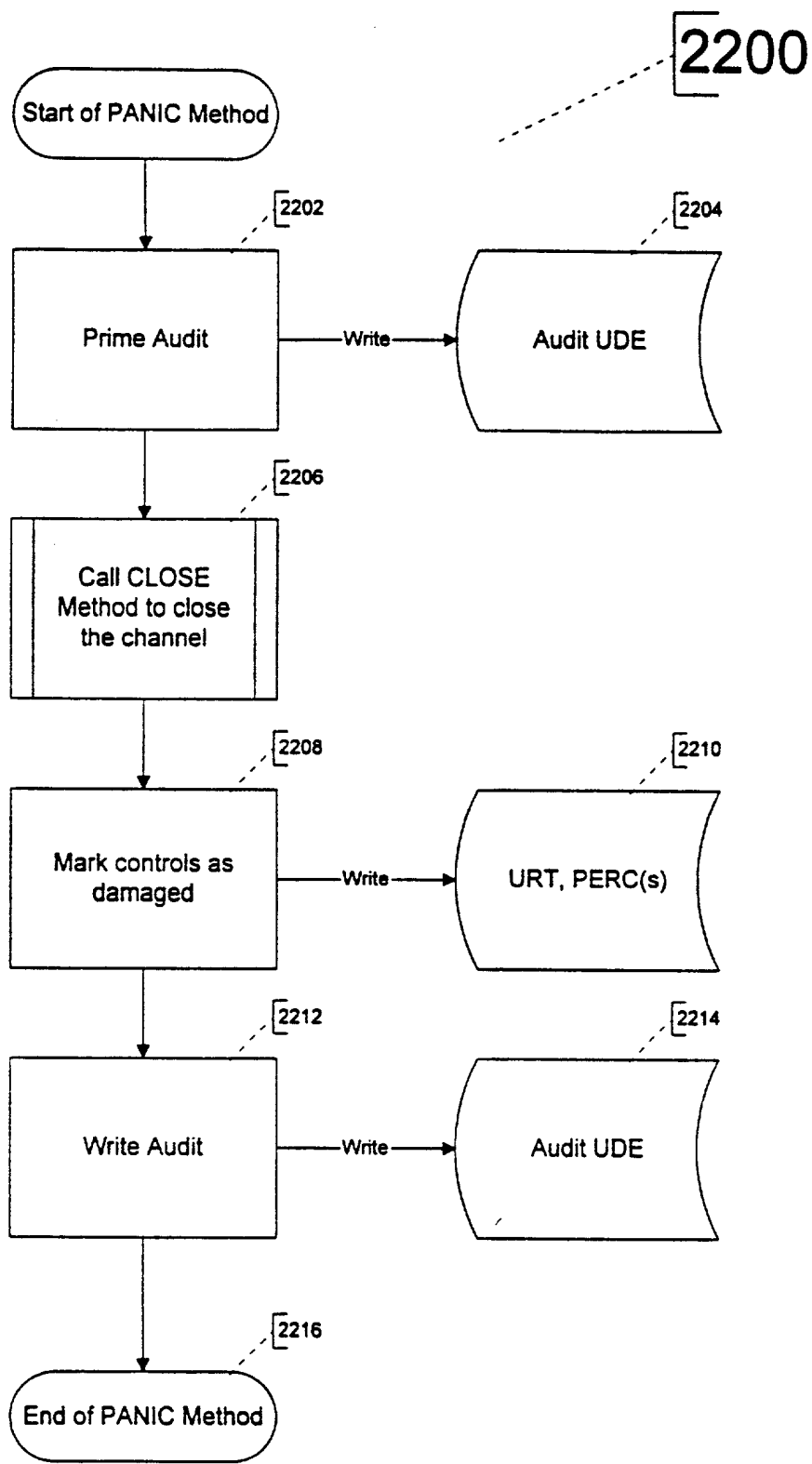


Figure 60

DESTROY Method Process Flow

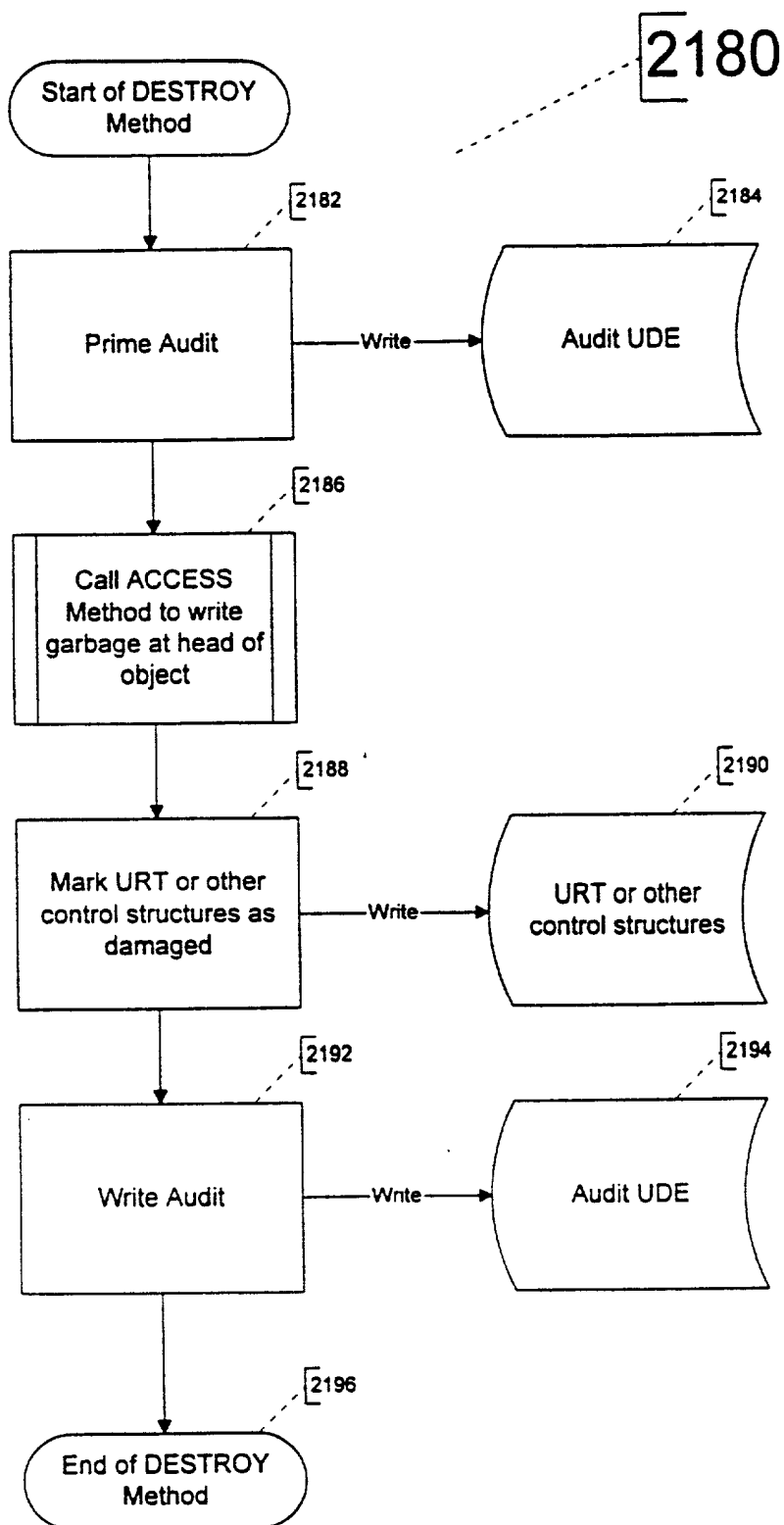
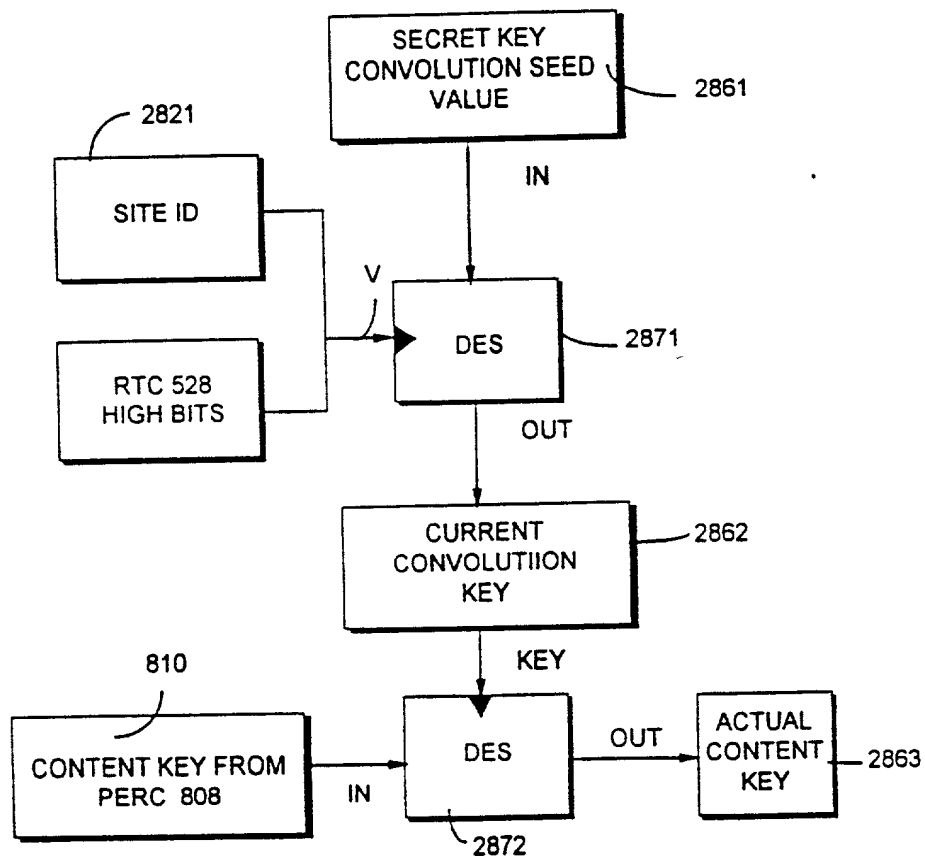


Figure 59

FIG. 62
KEY CONVOLUTION PROCESS



METER Method Use Process Flow

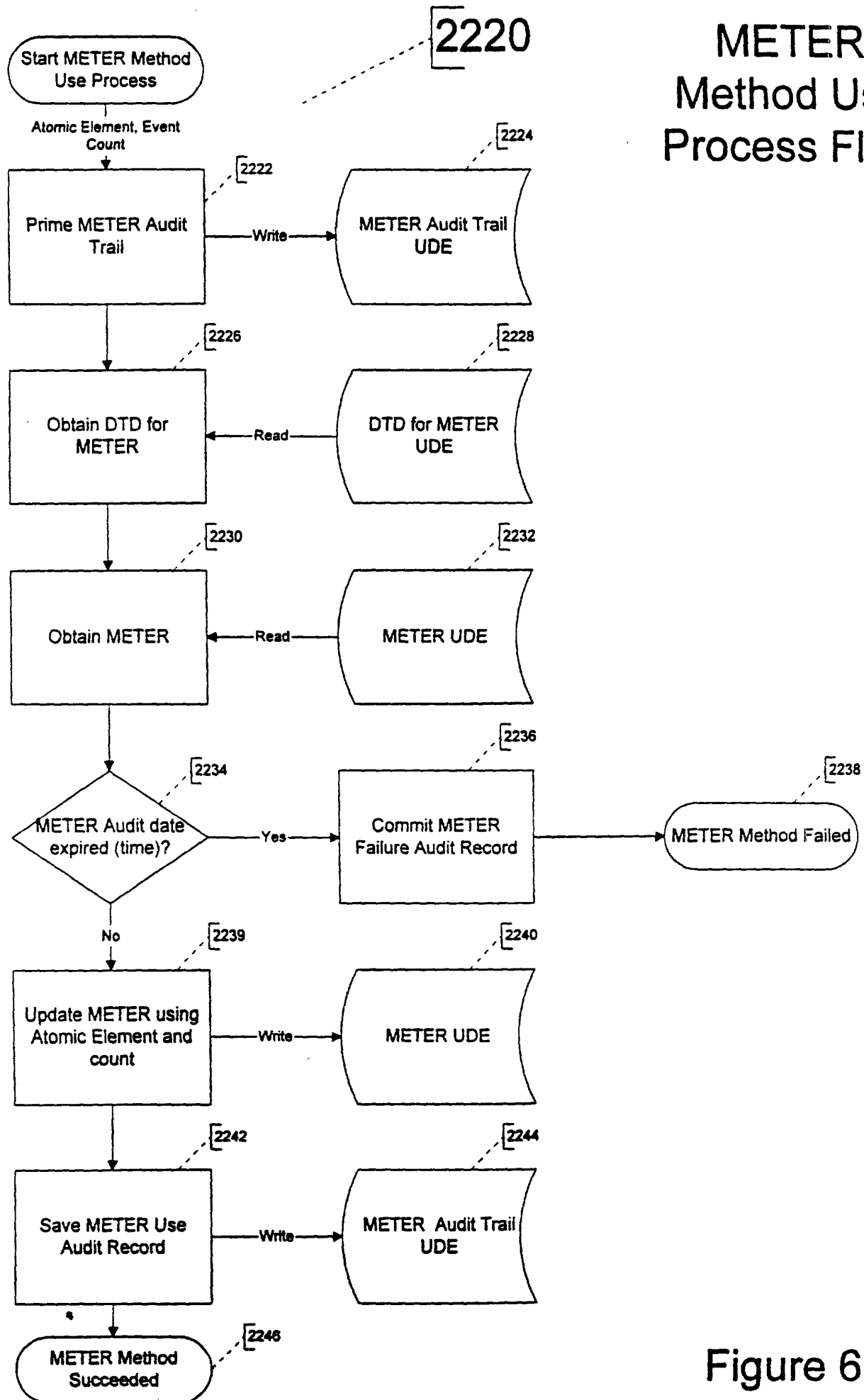
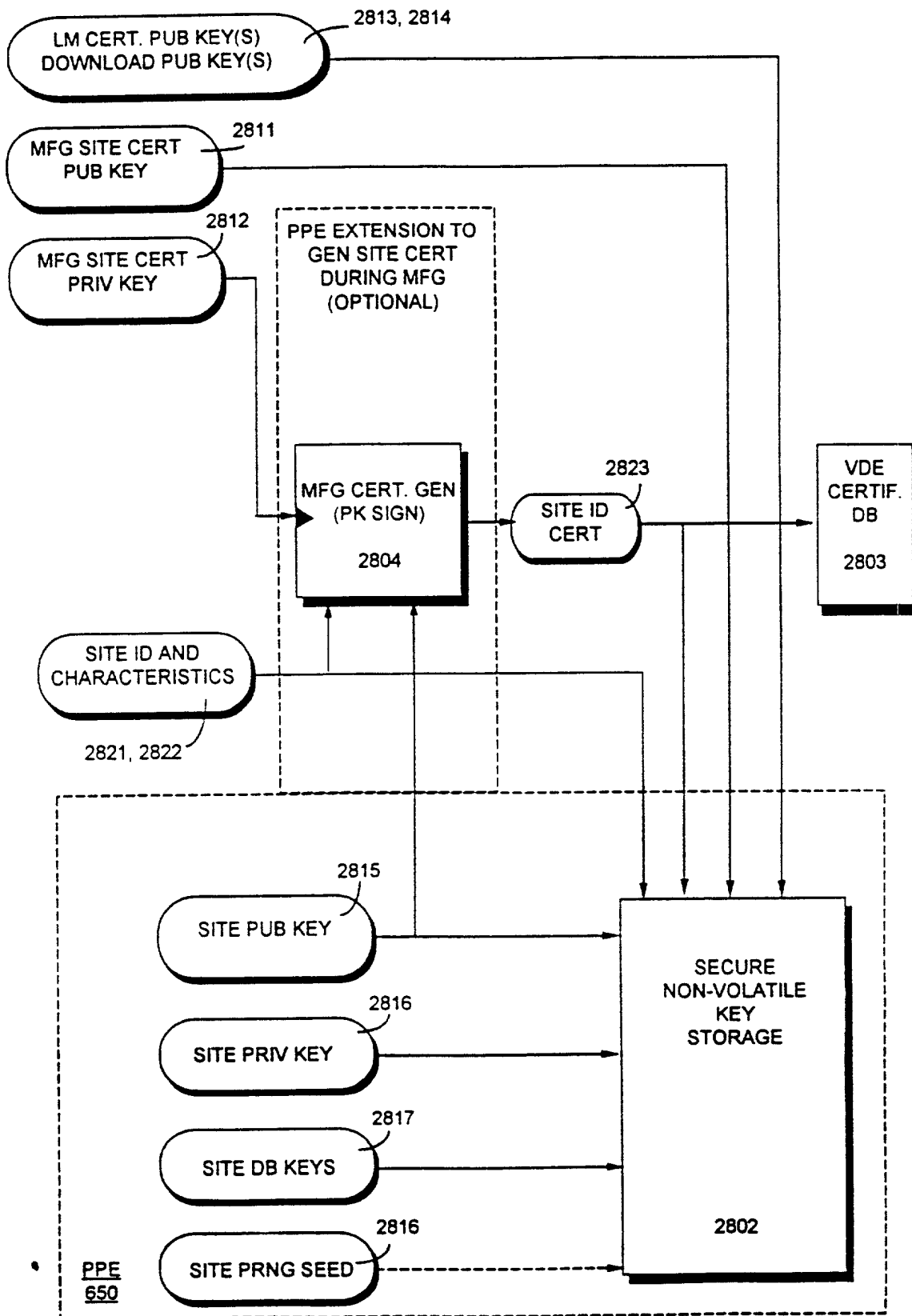


Figure 61

FIG. 64 SPU KEY INITIALIZATION/INSTALLATION



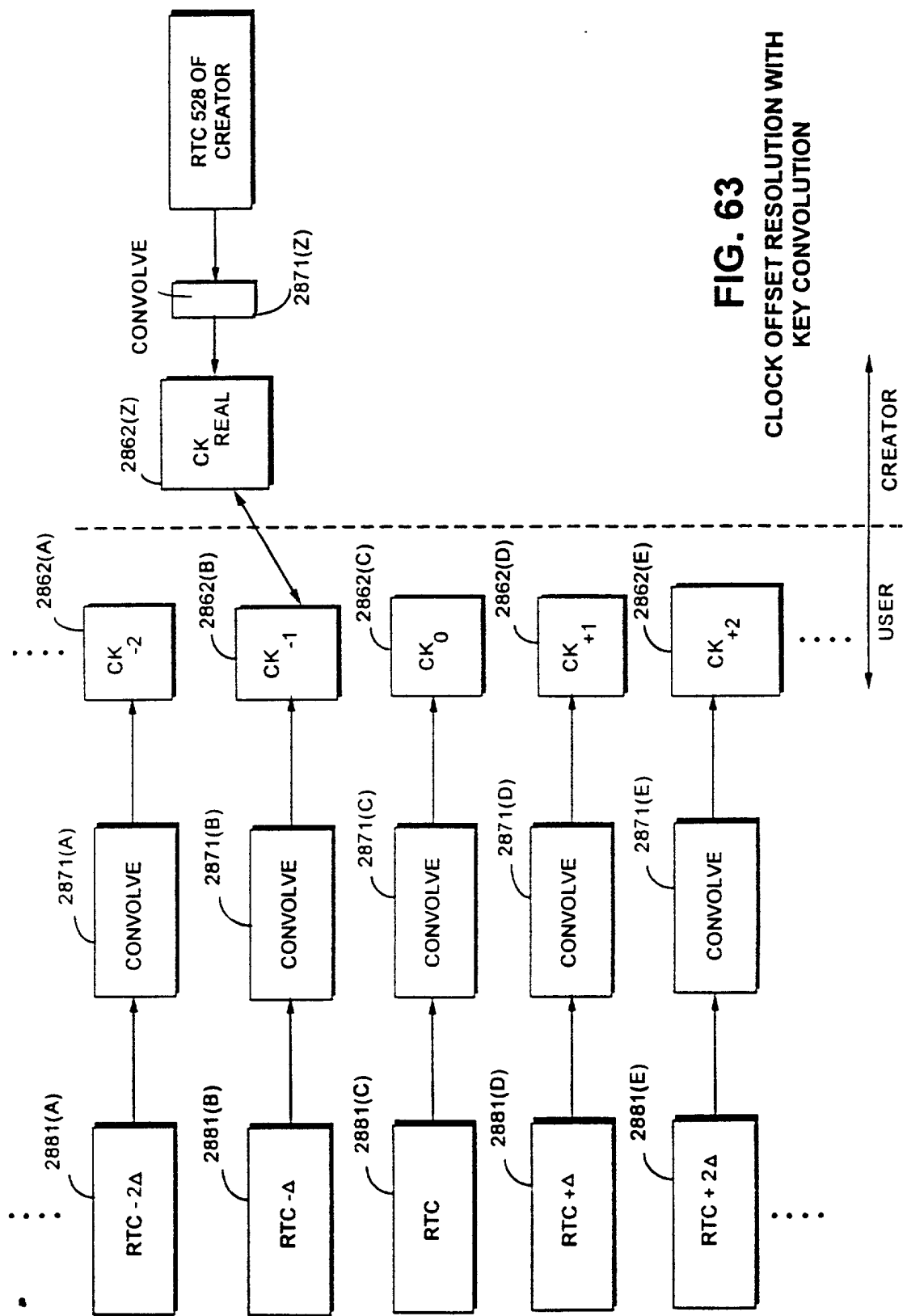
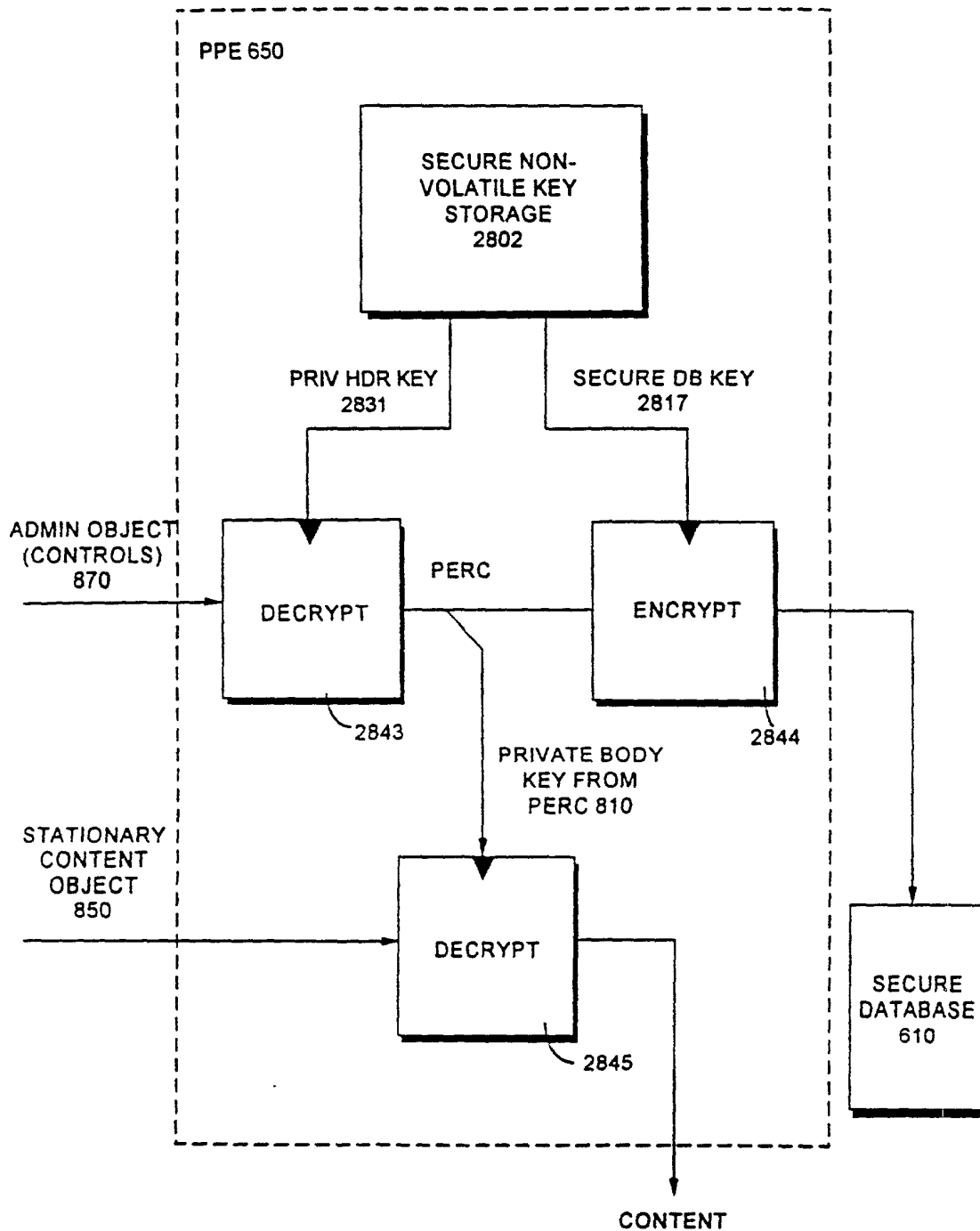


FIG. 63
CLOCK OFFSET RESOLUTION WITH
KEY CONVOLUTION



• FIG. 66 STATIONARY OBJECT DECRYPTION

FIG. 65 KEY INSTALLATION & UPDATE

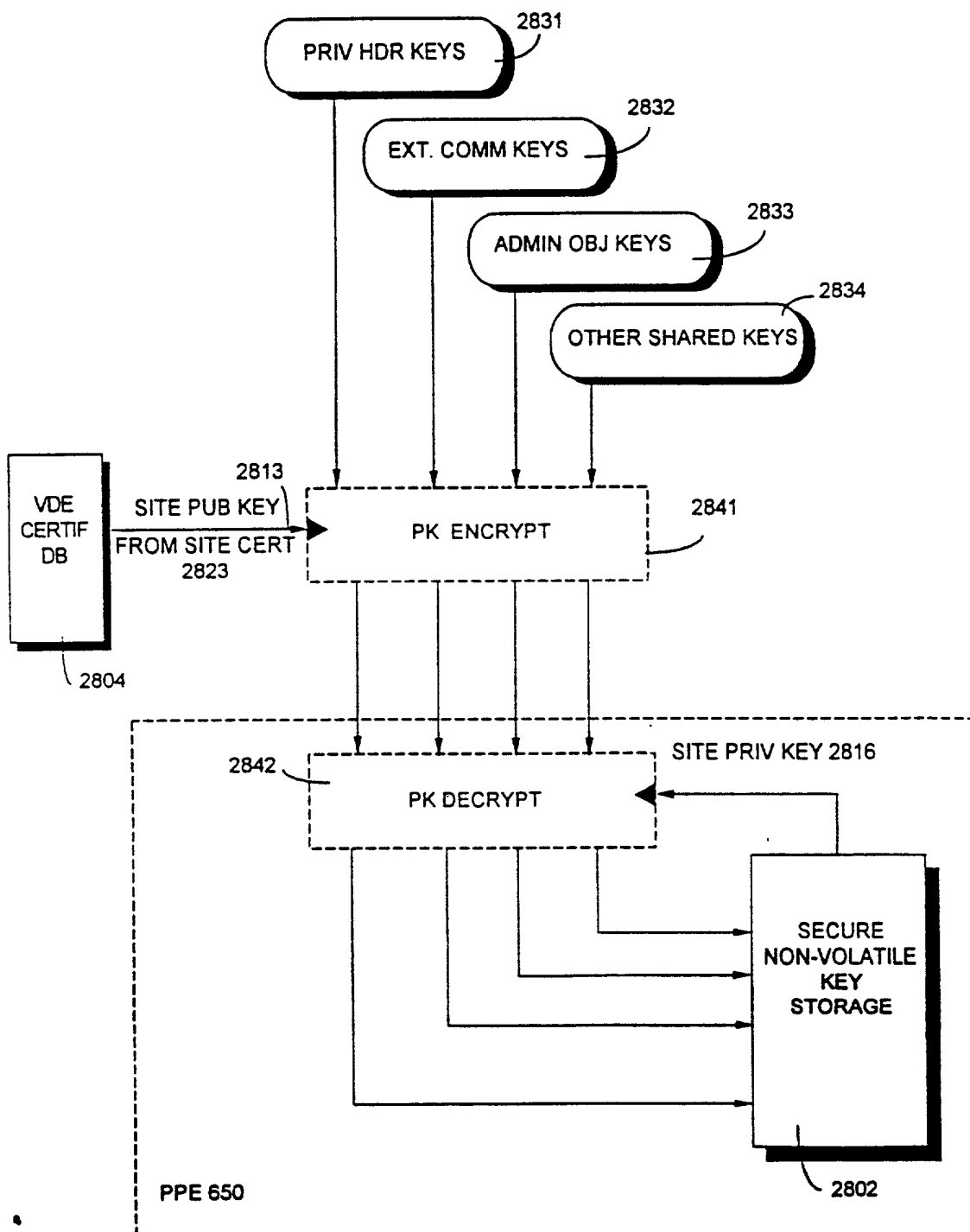
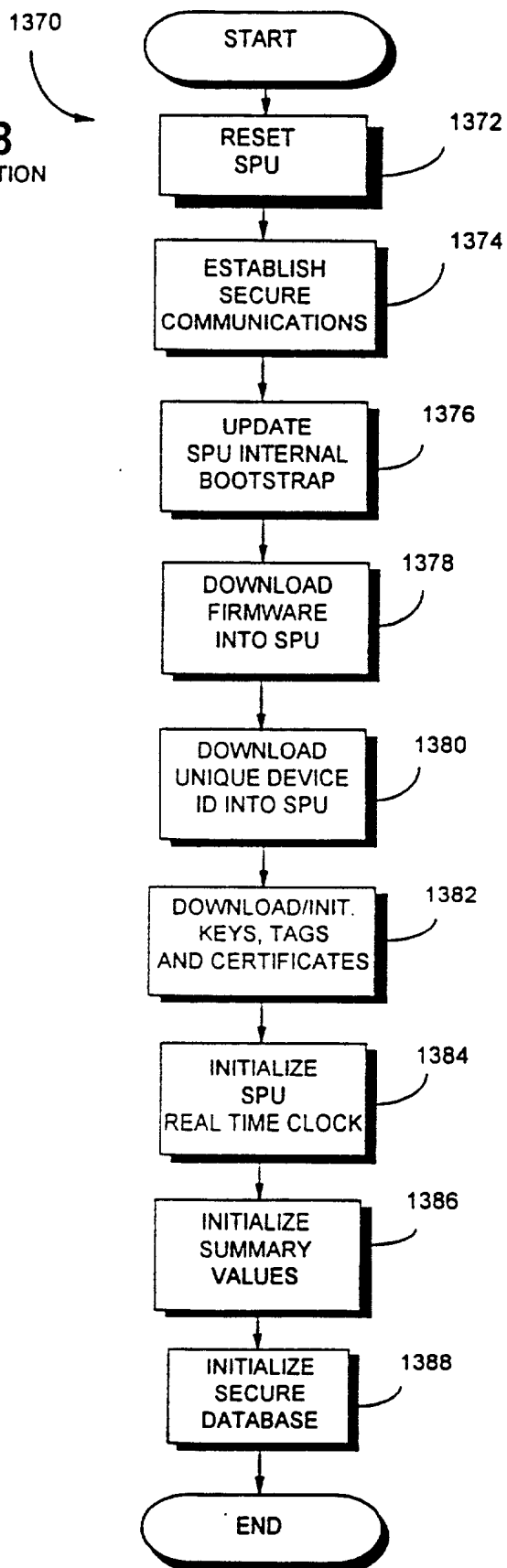


FIG. 68
SPU INITIALIZATION



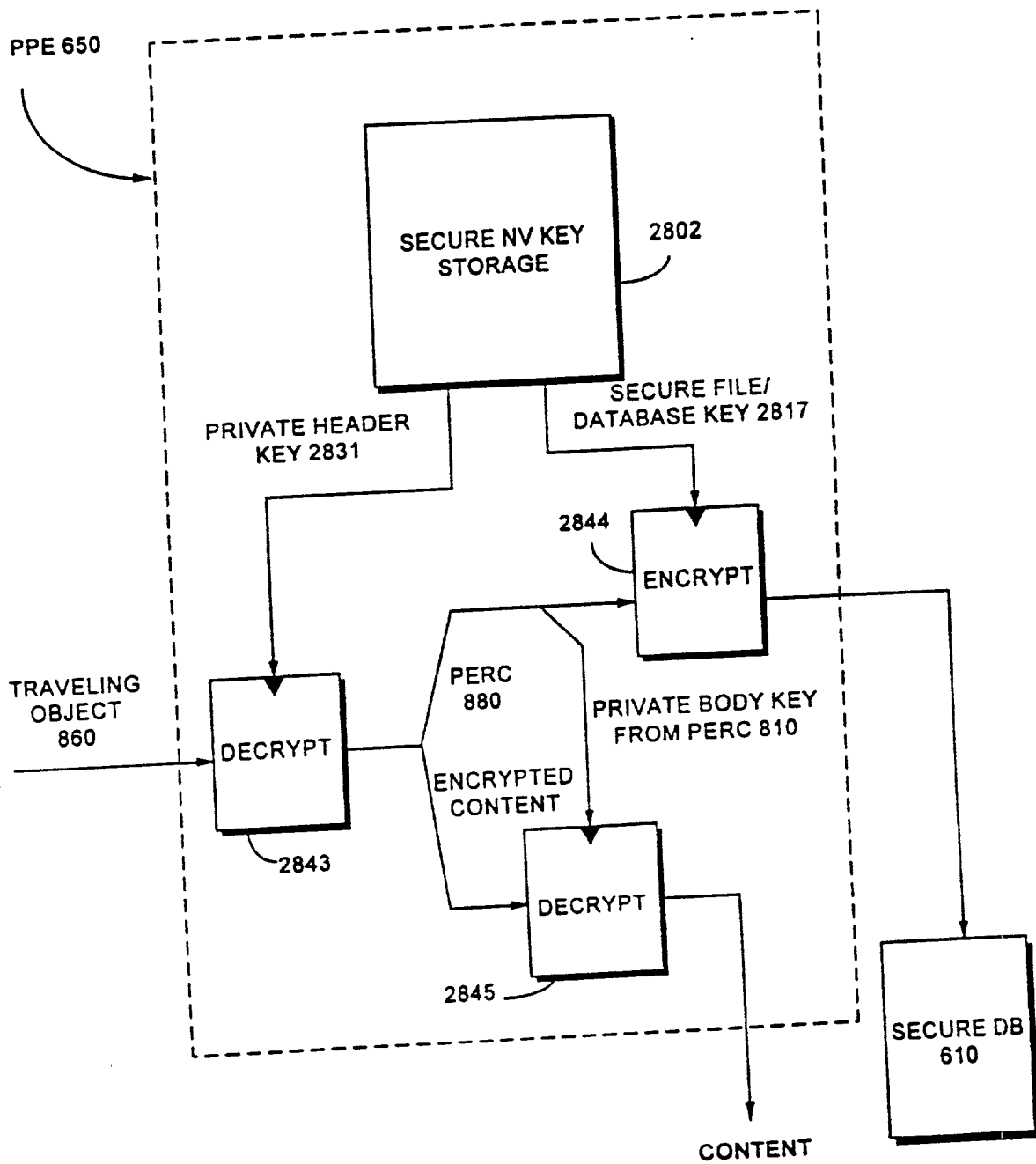


FIG. 67 TRAVELING OBJECT DECRYPTION

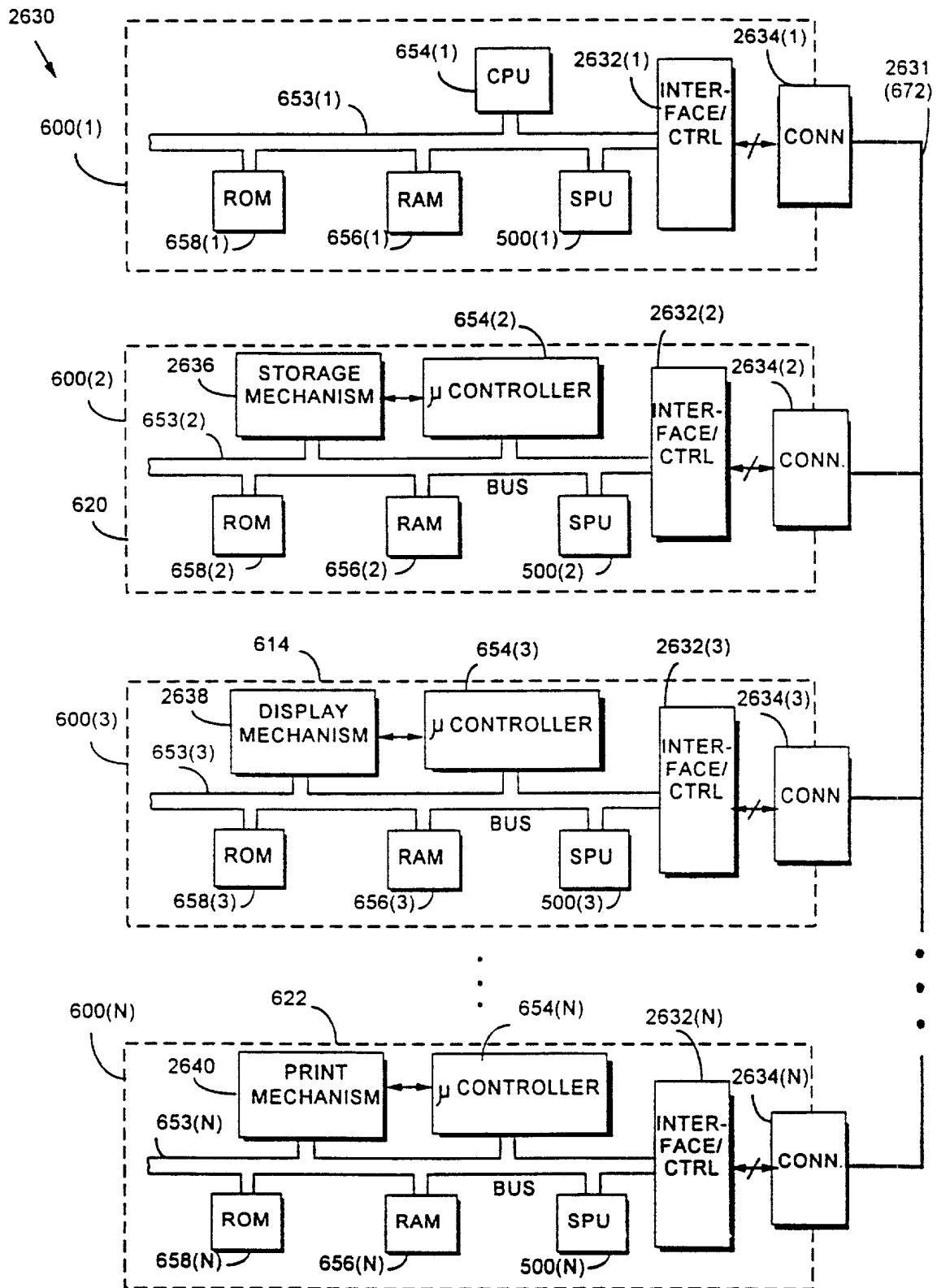


FIG. 70

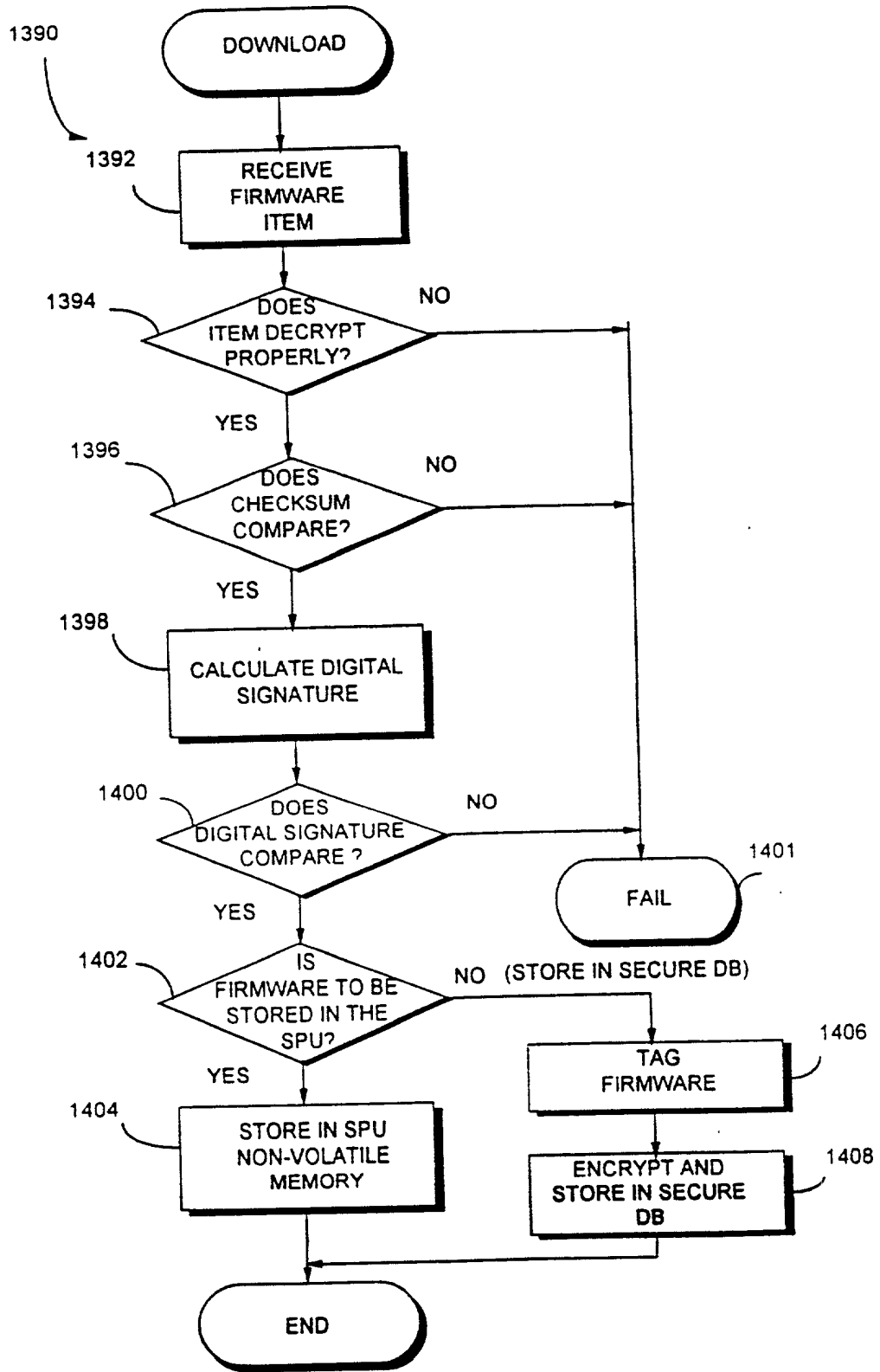


FIG. 69

SPU FIRMWARE
DOWNLOAD

LOG IN USER INTERFACE

182

USER NAME: SHEAR, V.

PASSWORD: * * * * *

☐ LOGIN AT STARTUP

LOGIN

CANCEL


HELP

FIG. 72A

FIG. 72B

2660

YOU HAVE REQUESTED THESE PROPERTIES:



LOONEY TUNES NEWS!

2662

APPROVE

SUSPEND

2664

PROPERTY INFO

Your Cost: \$7.50

MORE OPTIONS

FIG. 71

PORTABLE APPLIANCE

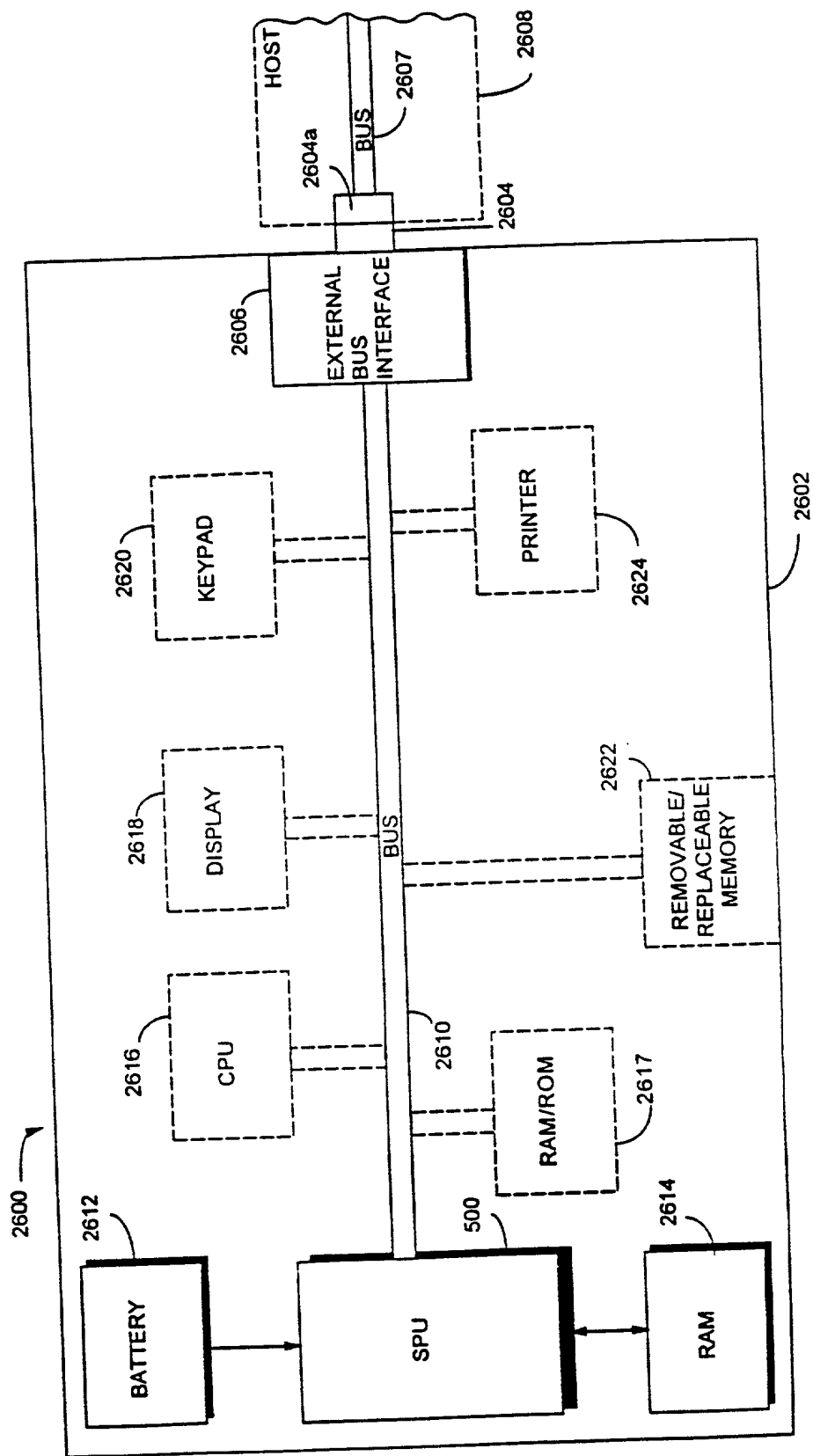
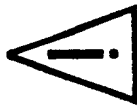


FIG. 72D



YOU HAVE REQUESTED THESE PROPERTIES:

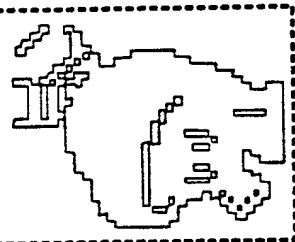
LOONEY TUNE NEWS!

PROPERTY INFO

YOUR COST : \$7.50

More Options ☒

Show Thumbnail



CANCEL

SUSPEND

APPROVE

PROPERTY:	SIZE:	PUBLISHER:	AMOUNT:	UNITS:	COST/UNIT:	TYPE:	USE?:	LINKS:	HIST:
CHUCK JONES BIOGRA...	256KB	WARNER NEW MEDIA	64	KBYTE	\$1.25	PREVIEW	✓	●	
▼ BUGS BUNNY.JPE...	1MB	WARNER NEW MEDIA	1	RECORD	\$5.00	DISPLAY	✓	●	
BUGS BUNNY.JPEG...	1MB	WARNER NEW MEDIA	10	RECORD	\$3.50	DISPLAY		●	
BUGS BUNNY.JPEG...	1MB	WARNER NEW MEDIA	25	RECORD	\$2.50	DISPLAY		●	
FRIZ FRELENG BIOGRA...	256KB	WARNER NEW MEDIA	120	SECTOR	\$5.00	PRINT			
TEX AVERY BIOGRAP ...	256KB	WARNER NEW MEDIA	50	PERCENT	\$2.50	COPY			
► DUCKI RABBIT DU...	64MB	WARNER NEW MEDIA	7.0	MINUTE	\$7.50	COPY-PRO			
MEL BLANC BIOGRAPH...	256KB	WARNER NEW MEDIA	1	SPECIAL	\$25.25	INSTALL			
LOONEY TUNES DATAB...	600MB	WARNER NEW MEDIA	1	OBJECT	\$2000.00	ALL		●	

SET LIMITS...	SHOW BUDGETS	ACQUIRE BUDGET	HISTORY ..	TRANSFER...	PREFERENCES...	FEEDBACK...	HELP!
---------------	--------------	----------------	------------	-------------	----------------	-------------	-------

FIG. 72C

SET LIMITS:

SESSION DOLLAR LIMIT: \$	<div data-bbox="743 890 919 961" data-label="Text">2666 50</div>	<div data-bbox="932 852 1003 970" data-label="Image"></div>	<div data-bbox="1026 840 1308 966" data-label="Text">2674 OK</div>
TRANSACTION DOLLAR LIMIT: \$	<div data-bbox="737 978 919 1045" data-label="Text">50</div>	<div data-bbox="932 1020 1032 1045" data-label="Text">2668</div>	<div data-bbox="1036 995 1321 1121" data-label="Text">CANCEL</div>
TIME LIMIT (IN MINUTES):	<div data-bbox="737 1071 919 1138" data-label="Text">50</div>	<div data-bbox="932 1104 1032 1129" data-label="Text">2670</div>	
UNIT LIMIT:	<div data-bbox="743 1155 928 1226" data-label="Text">50</div>	<div data-bbox="828 1289 889 1314" data-label="Text">2672</div>	<div data-bbox="1071 1150 1295 1239" data-label="Text">HELP!</div>

FIG. 74

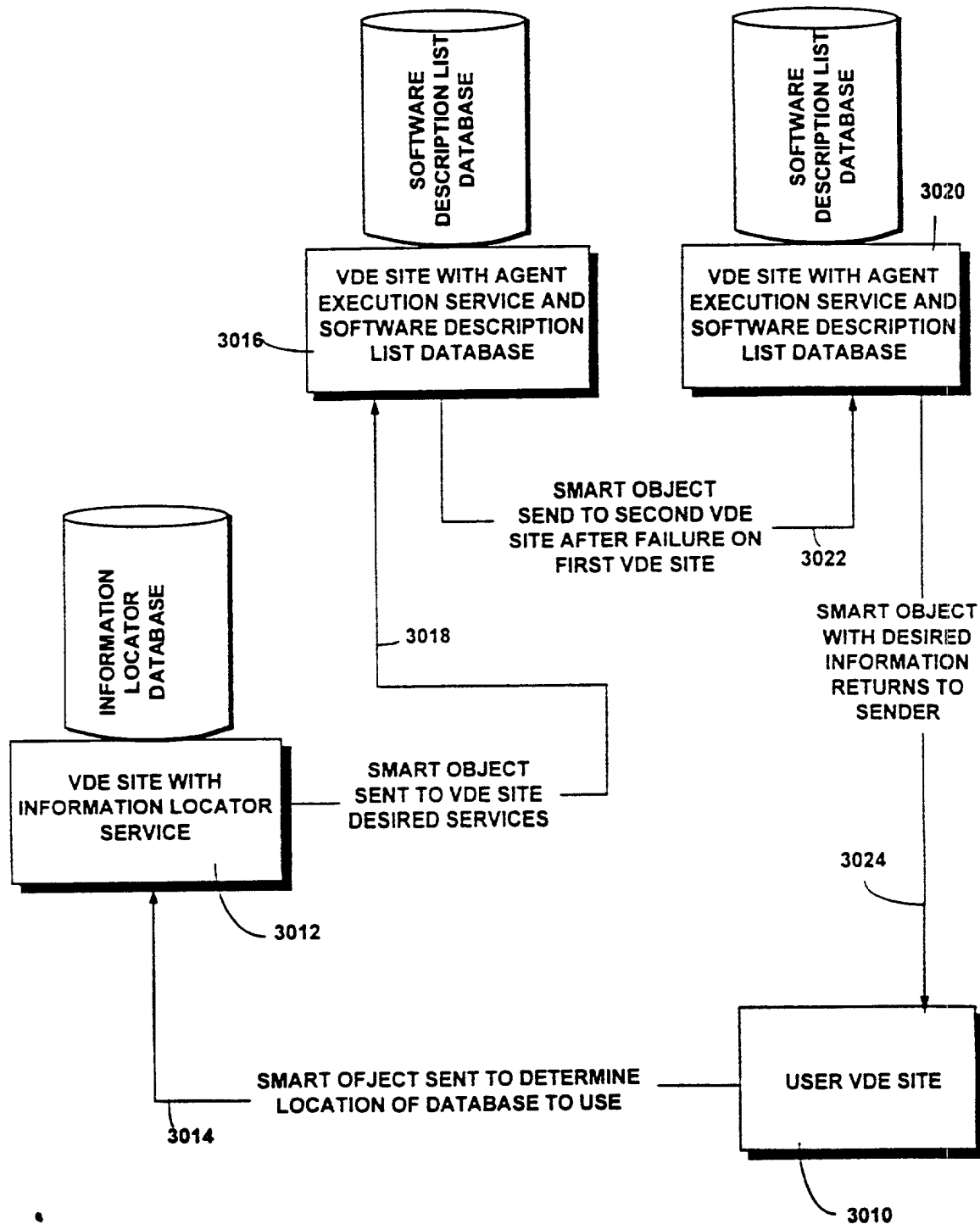


FIG. 73

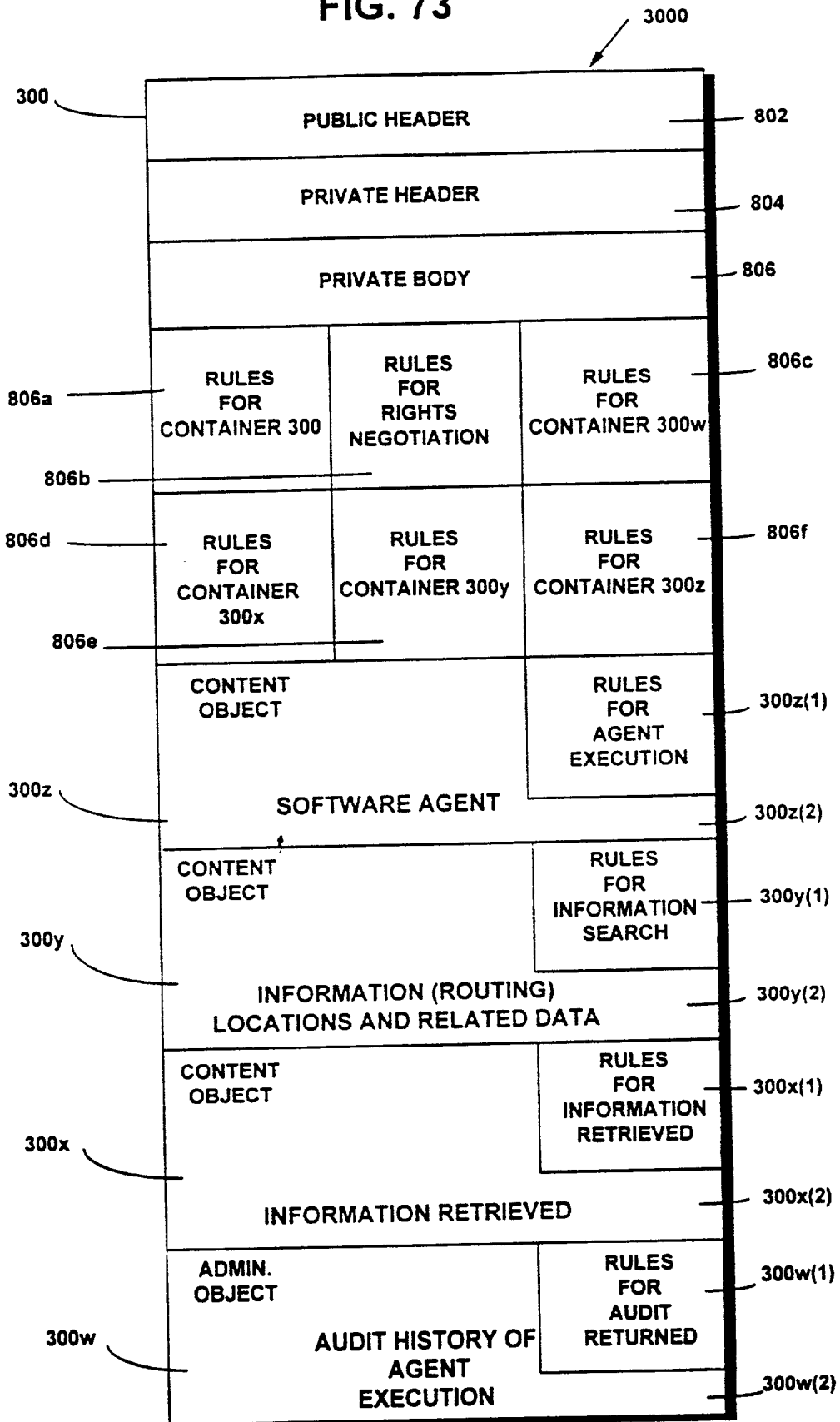


FIG. 75B

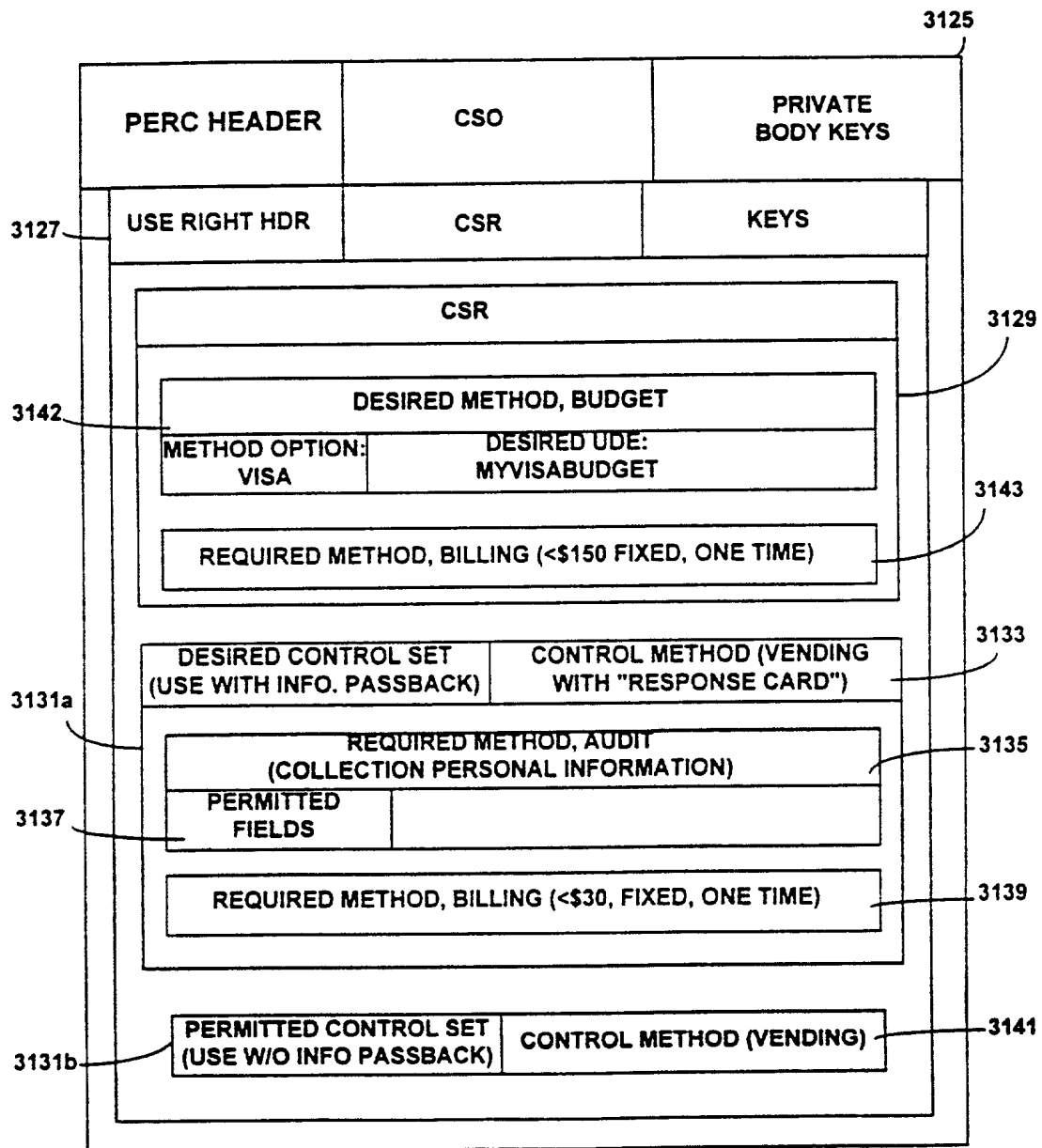


FIG. 75A

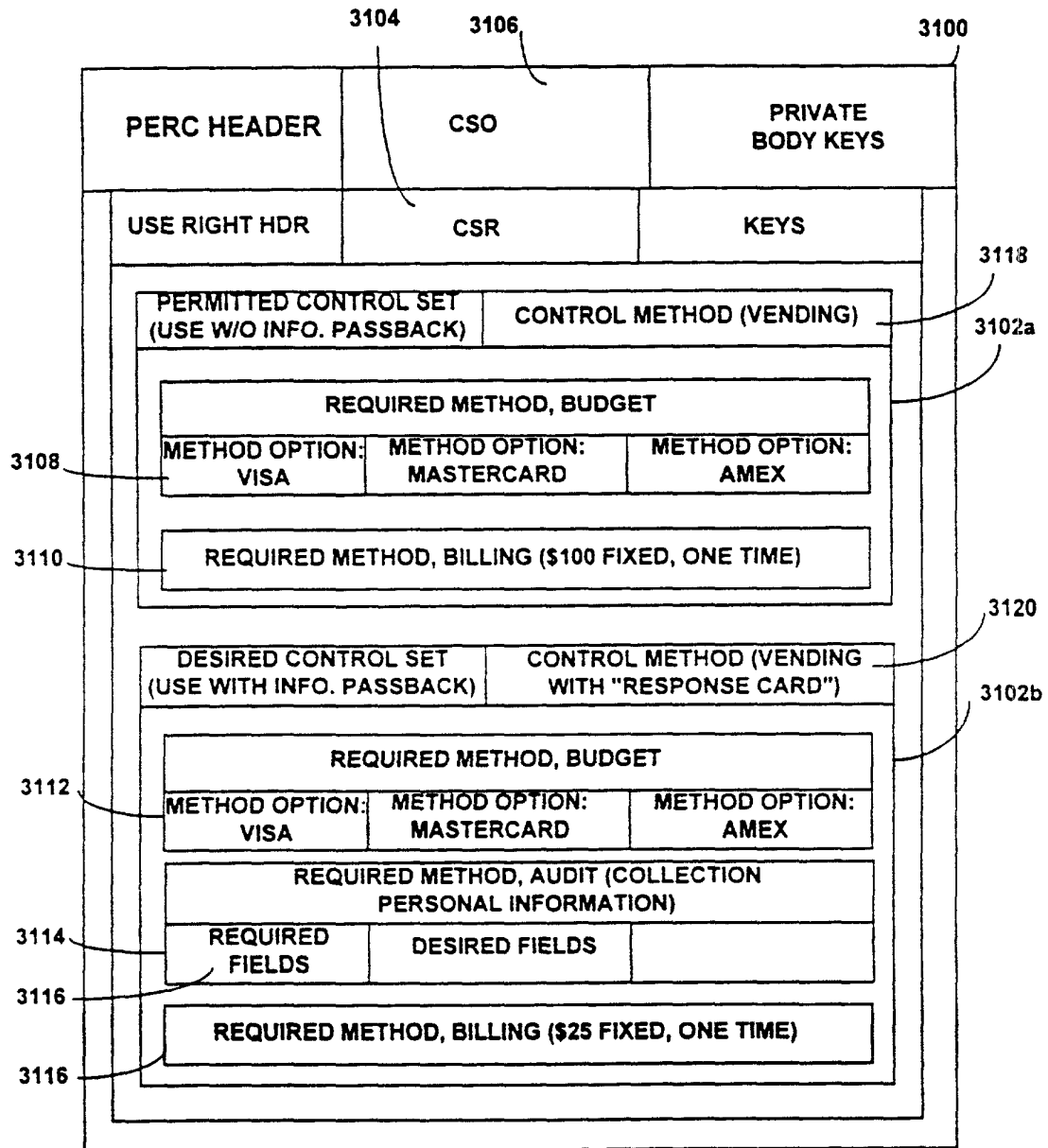


FIG. 75D

URT HEADER		CSO	DIGITAL SIGNATURE	3160
USE RIGHT HDR		CSR		
CONTROL SET(USE WITH INFO. PASSBACK)		CONTROL METHOD(VENDING WITH "RESPONSE CARD")		
3162	REQUIRED METHOD, BUDGET			
3164	METHOD OPTION: VISA	DESIRED UDE: MYVISABUDGET		
3166	REQUIRED METHOD, AUDIT (COLLECTION PERSONAL INFORMATION)			
	PERMITTED FIELDS			
3170	REQUIRED METHOD, BILLING(\$25, FIXED, ONE TIME)			

FIG. 75C

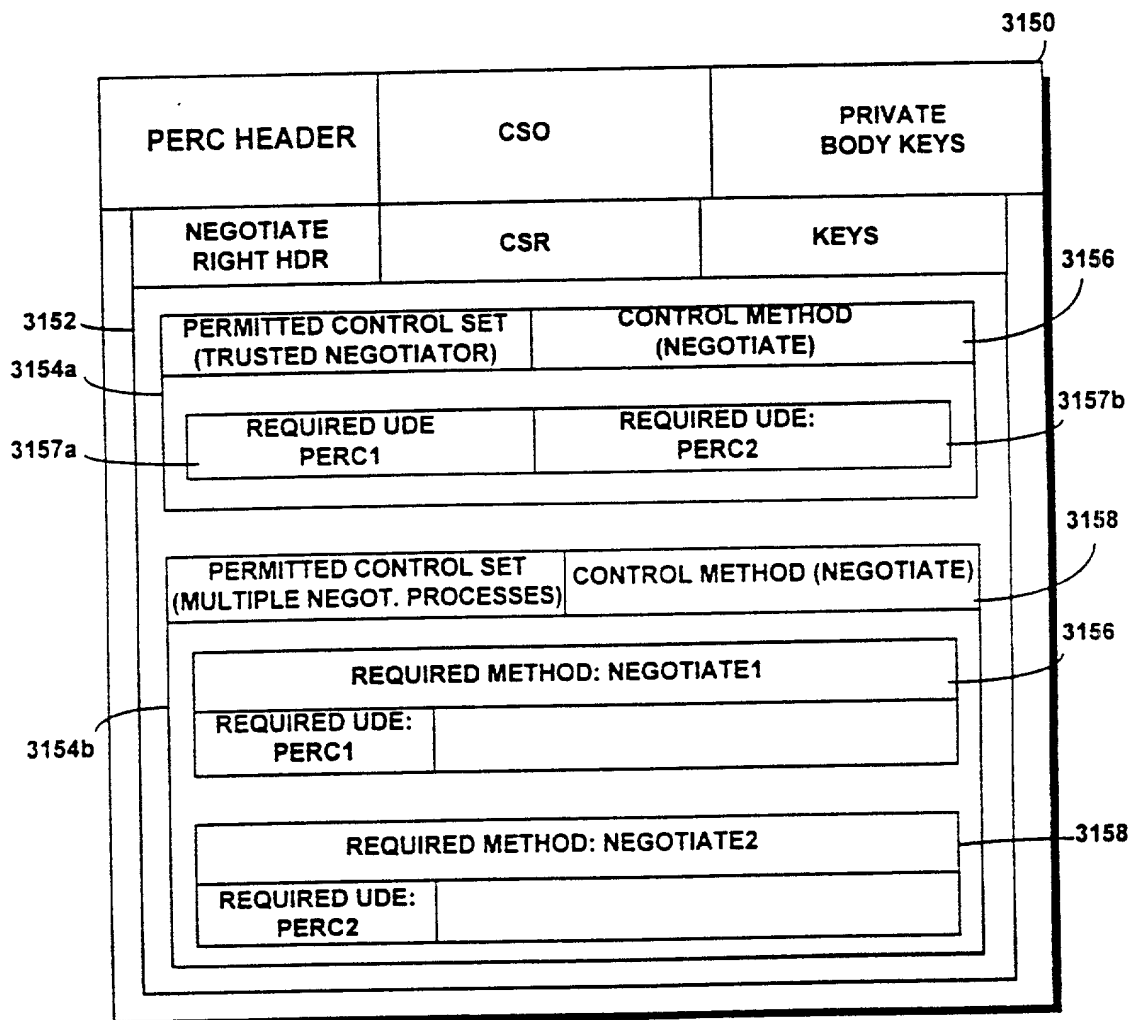
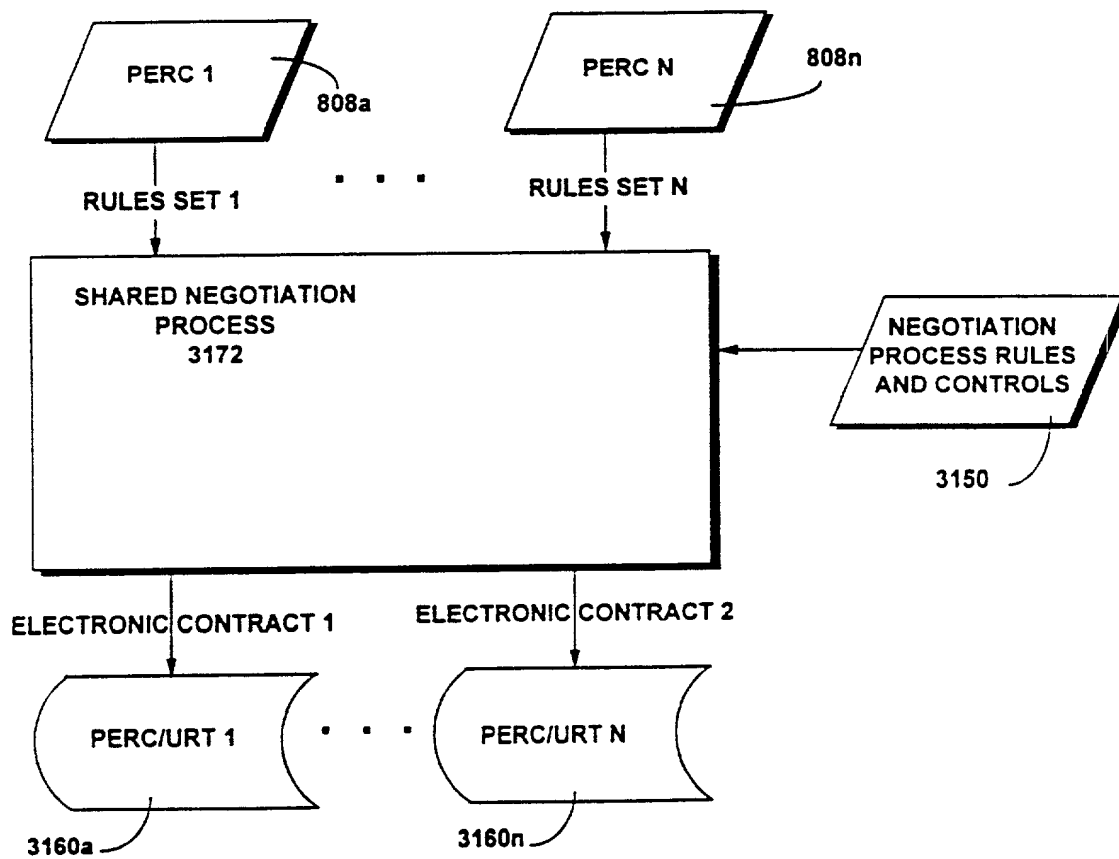


FIG. 76A



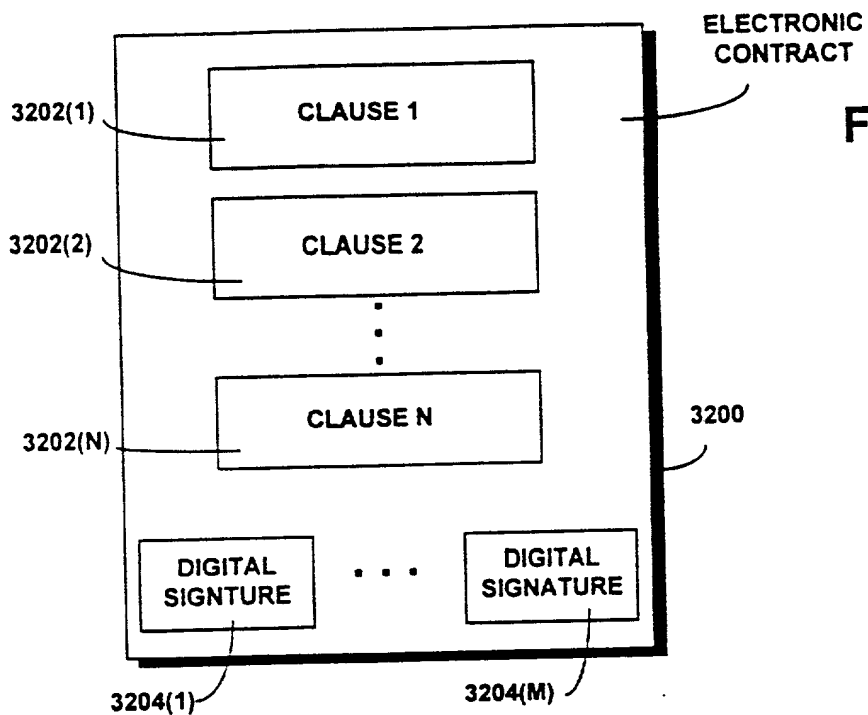


FIG. 75E

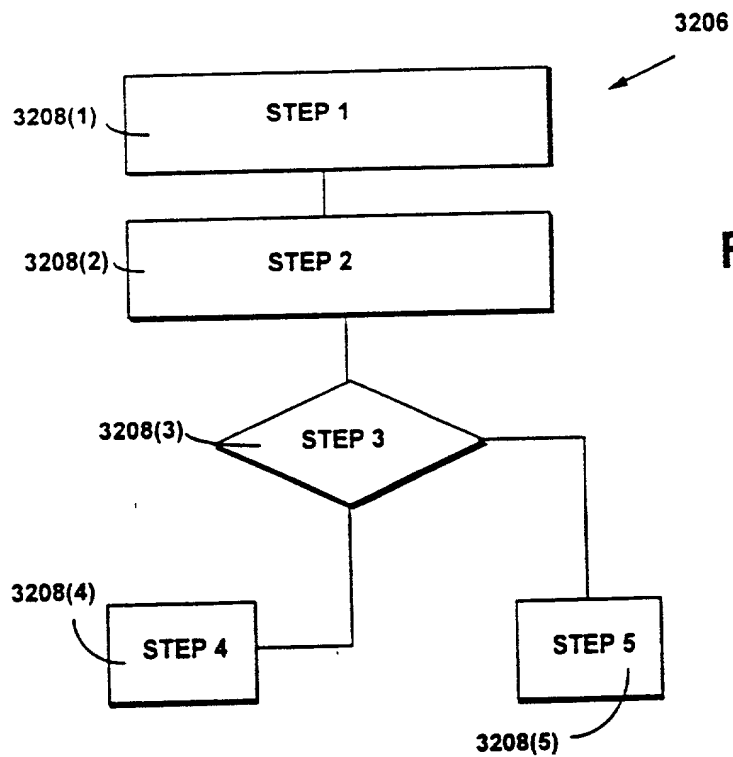


FIG. 75F

FIG. 77

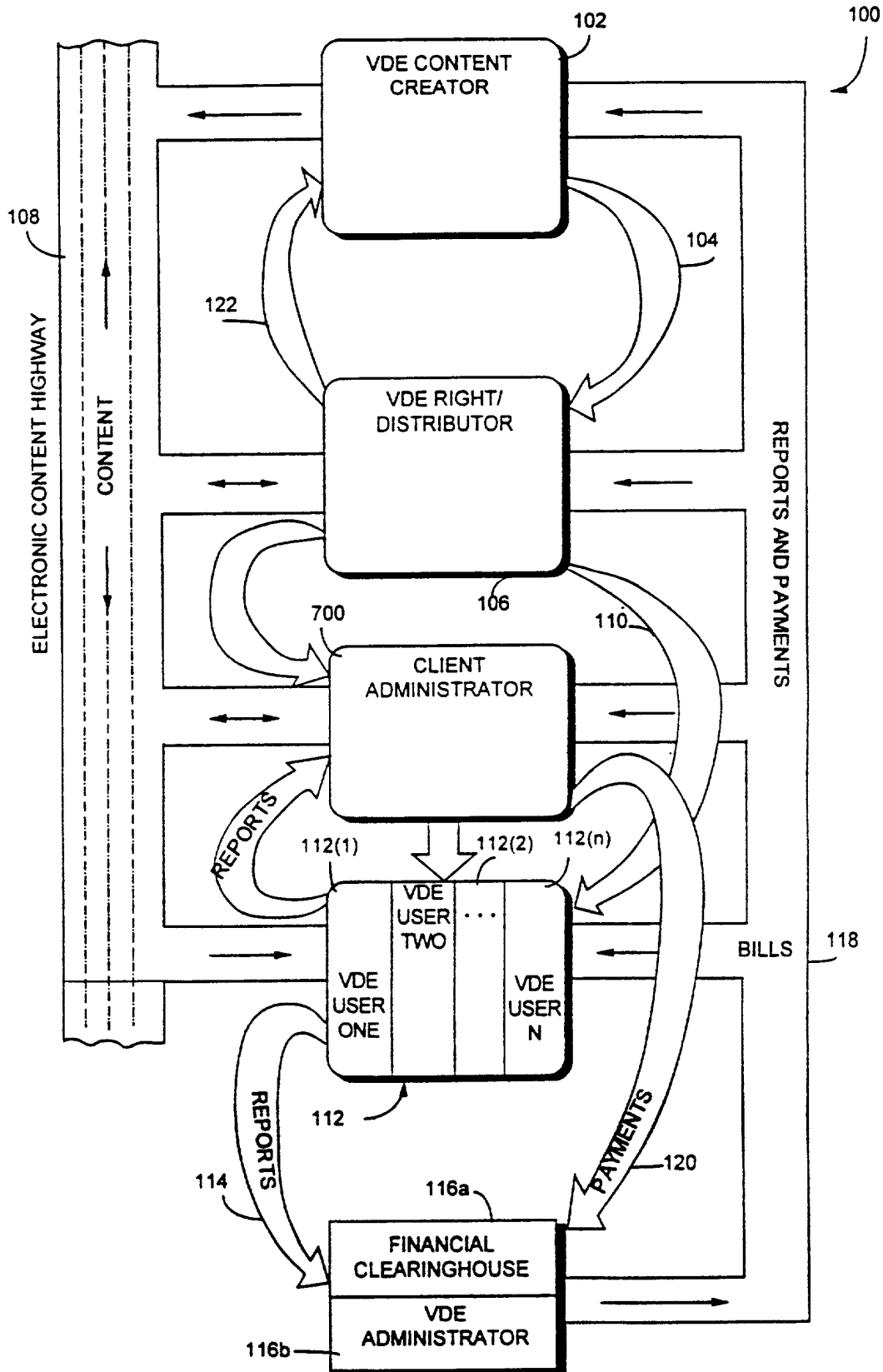


FIG. 76B

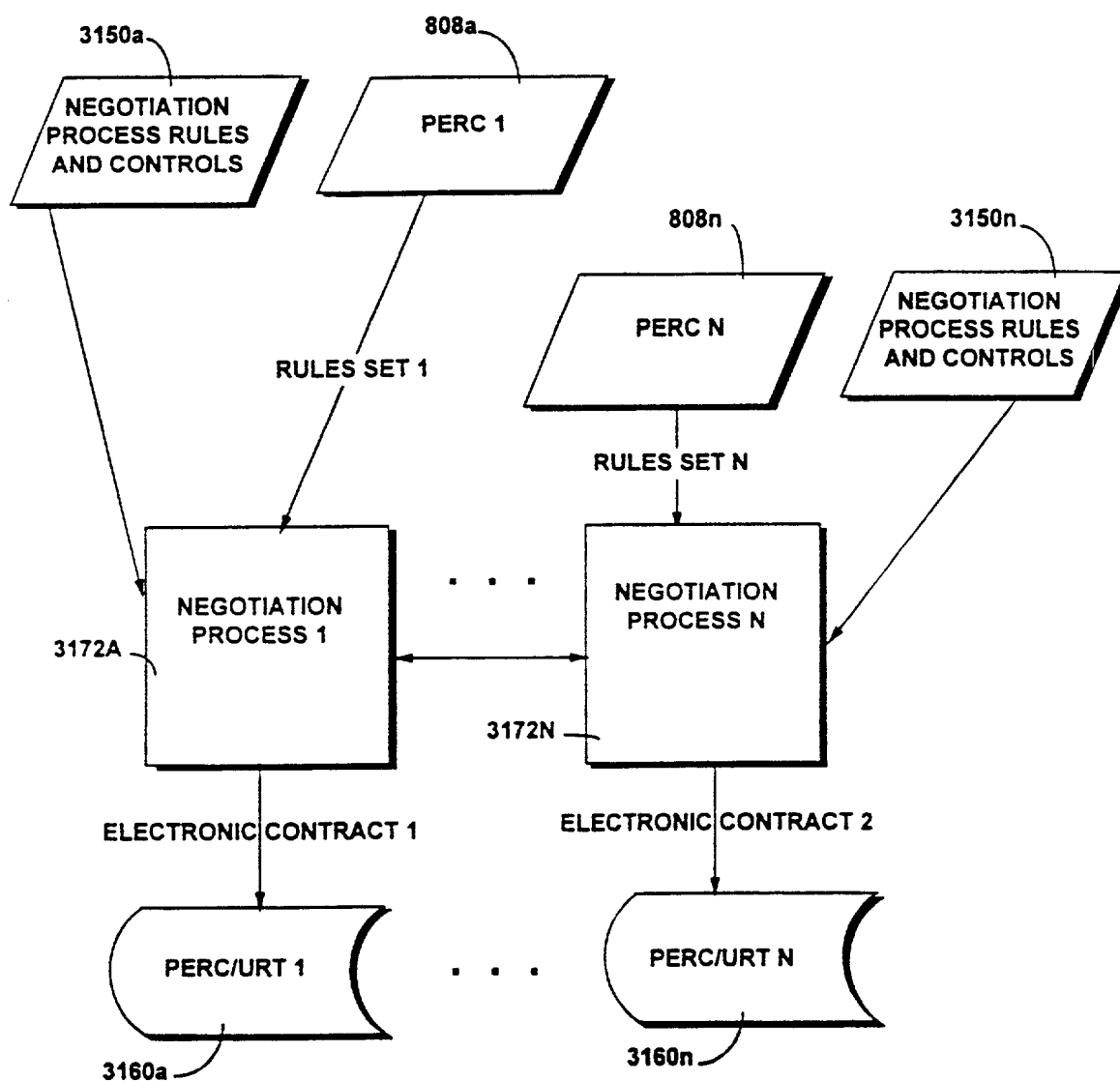
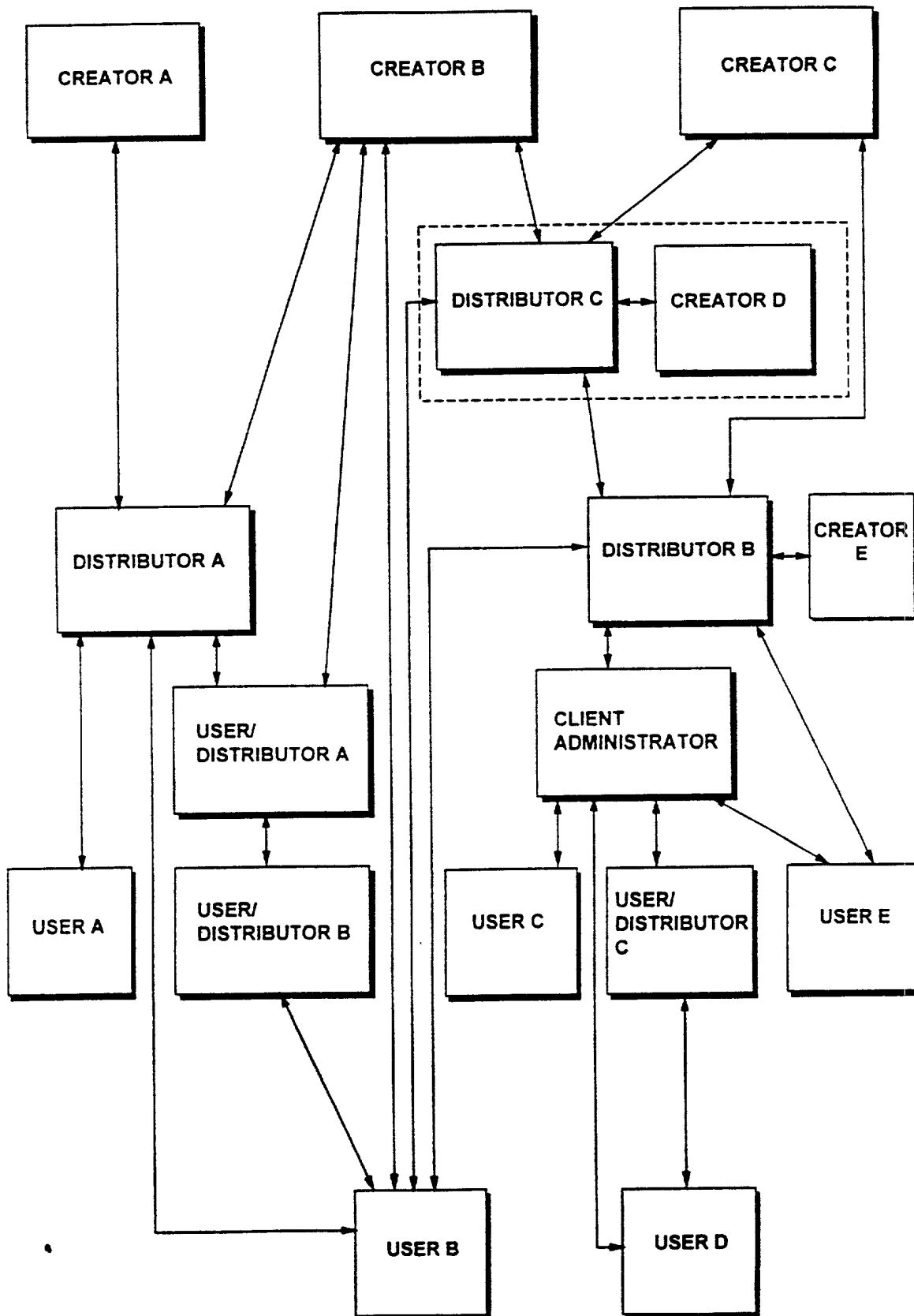


FIG. 79



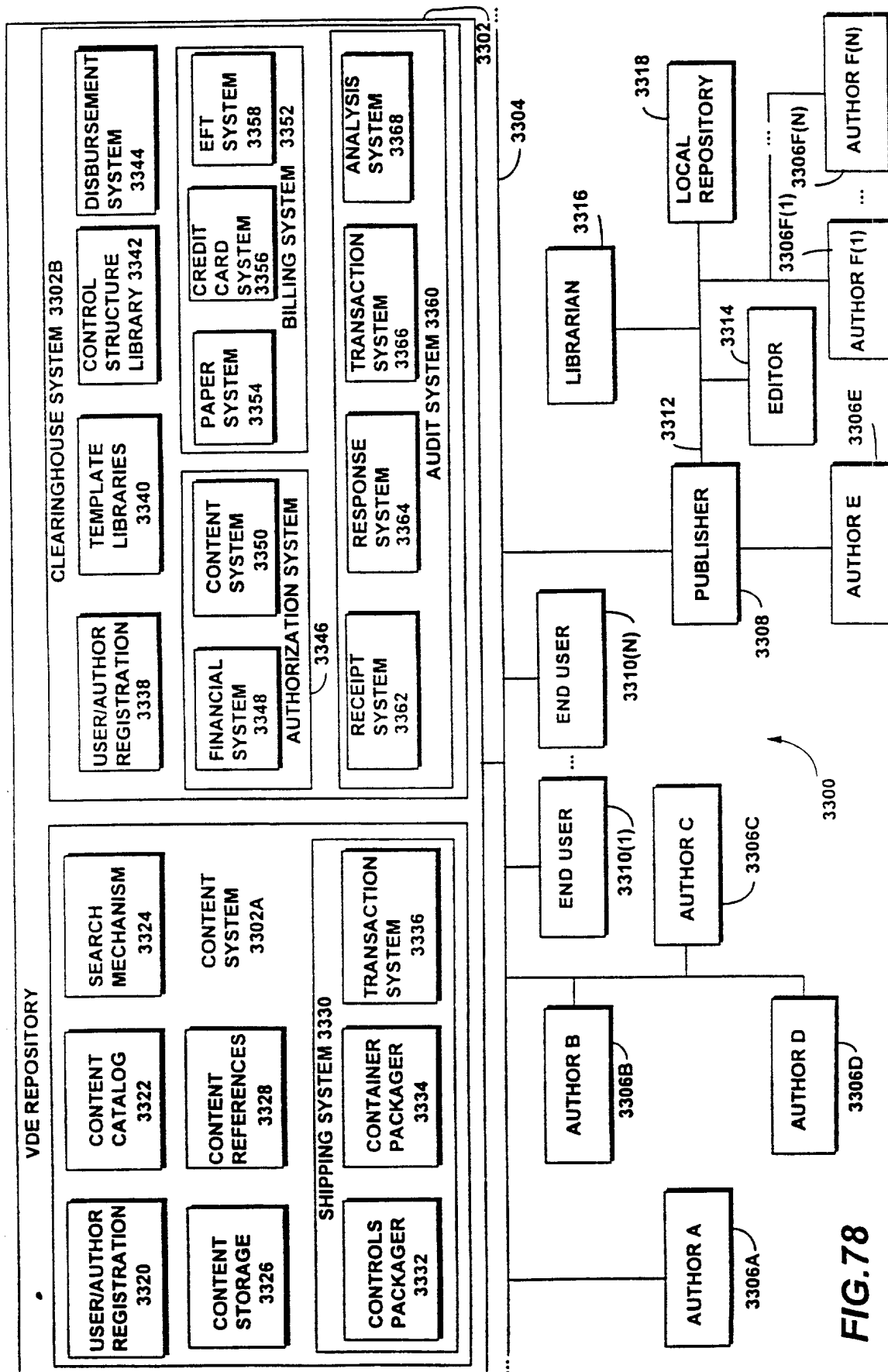


FIG.78

FIG. 80

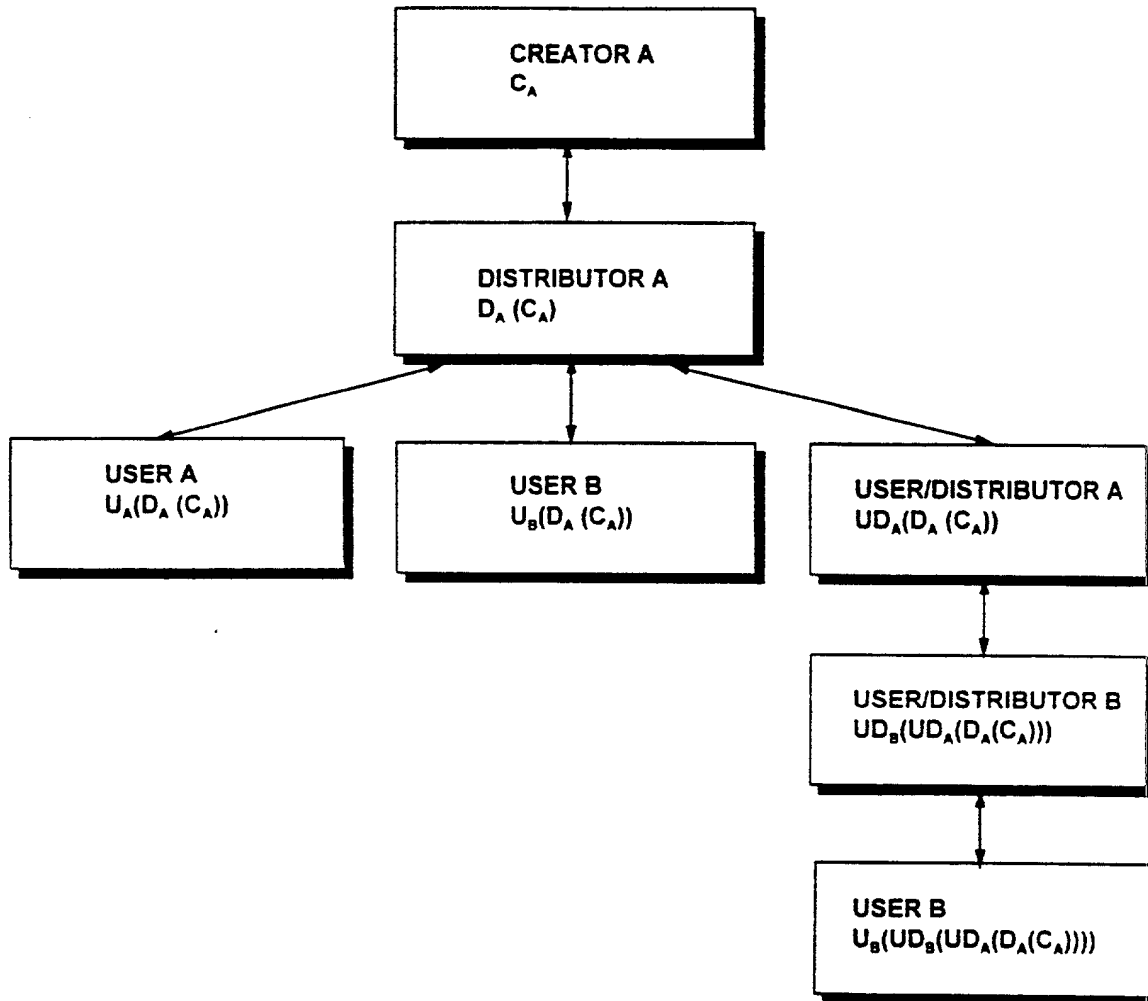


FIG. 83

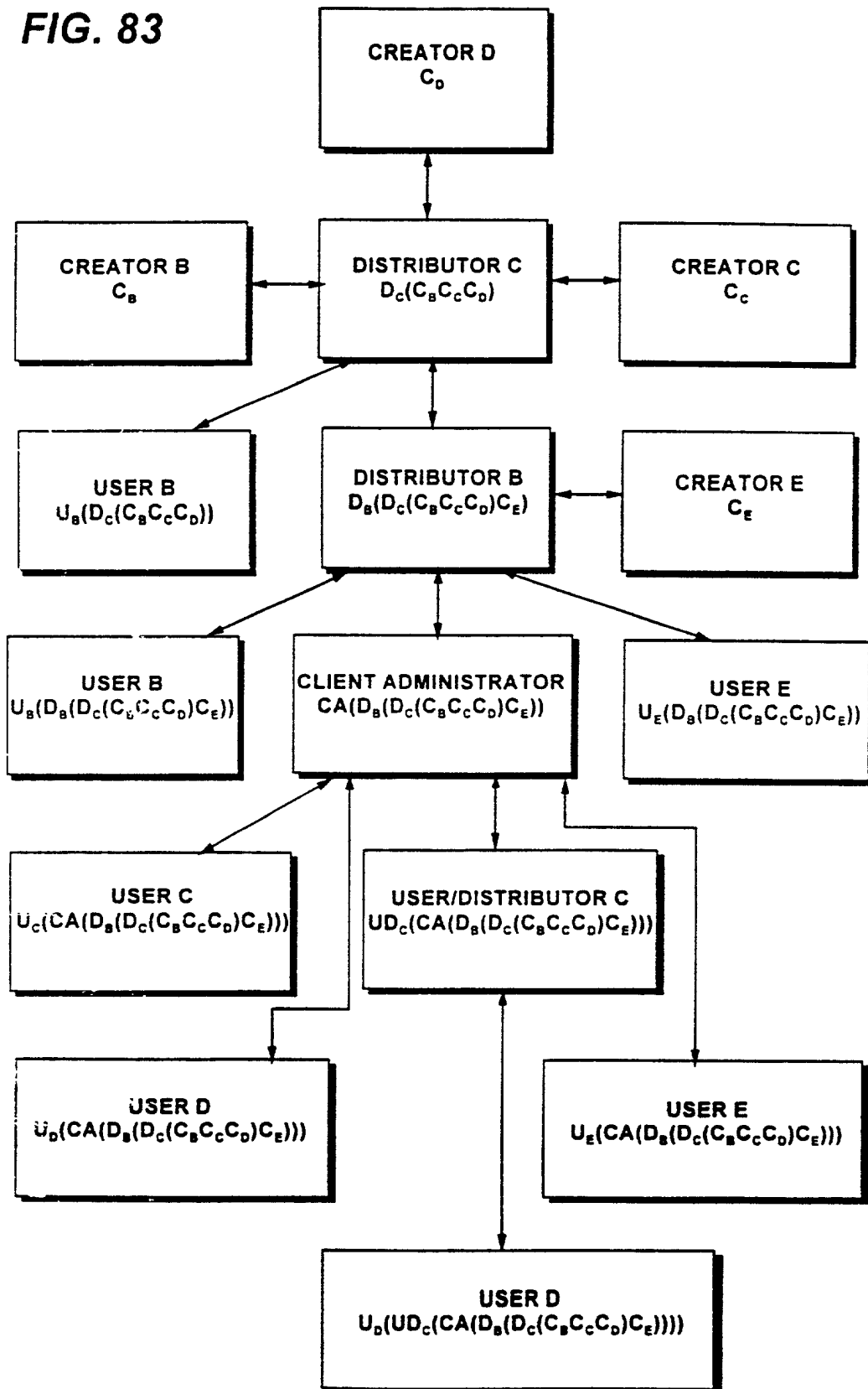


FIG. 82

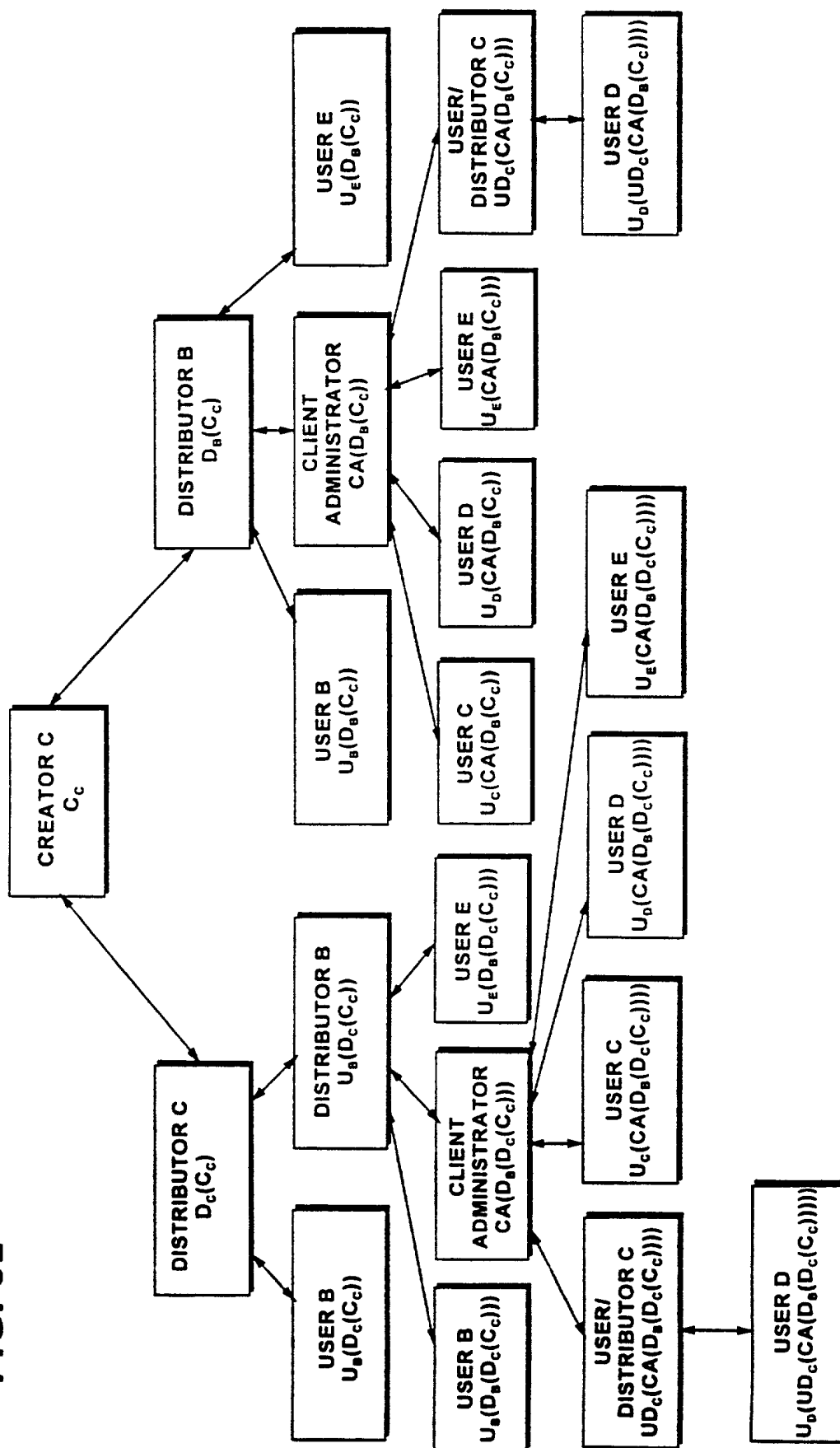


FIG. 85

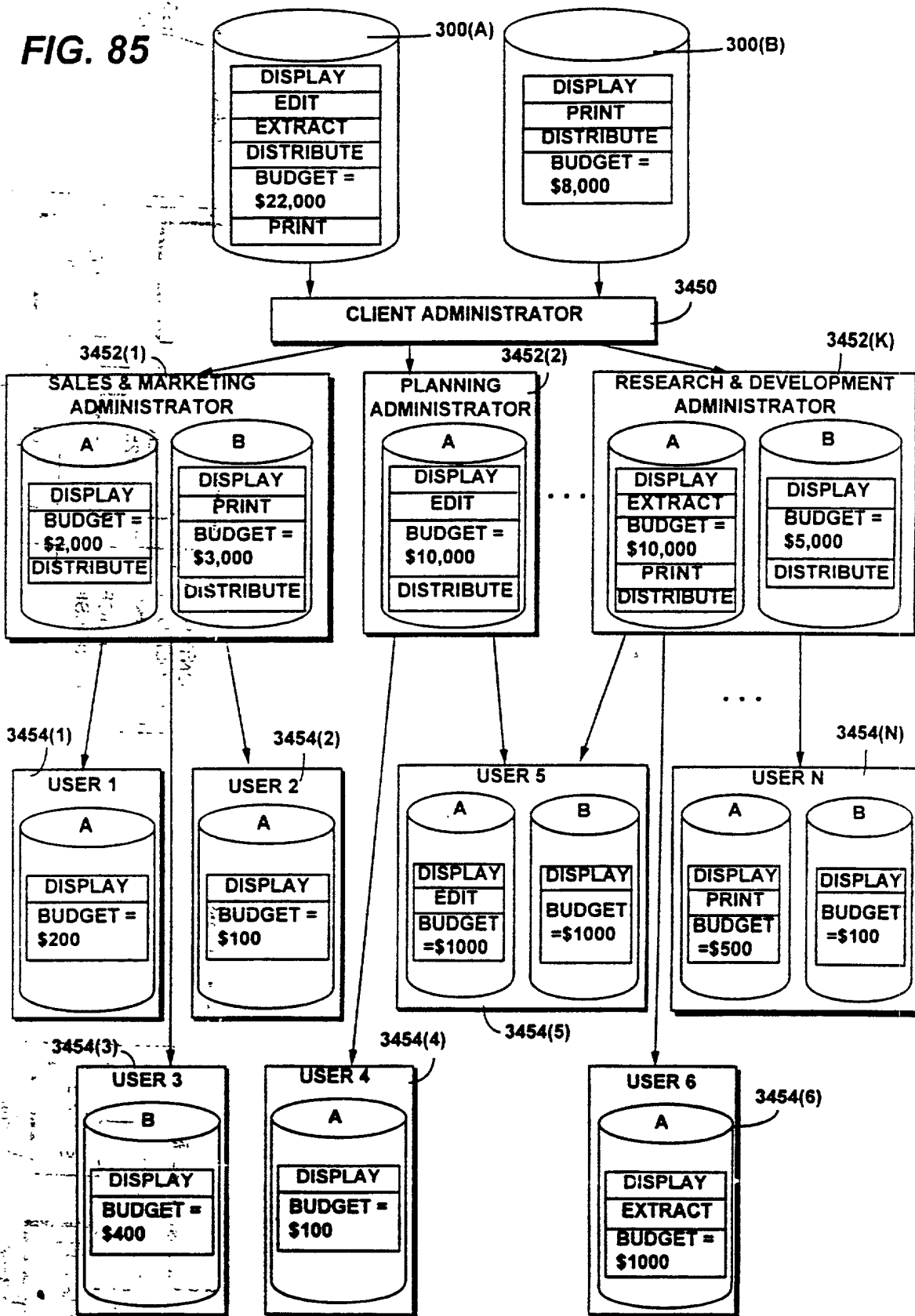
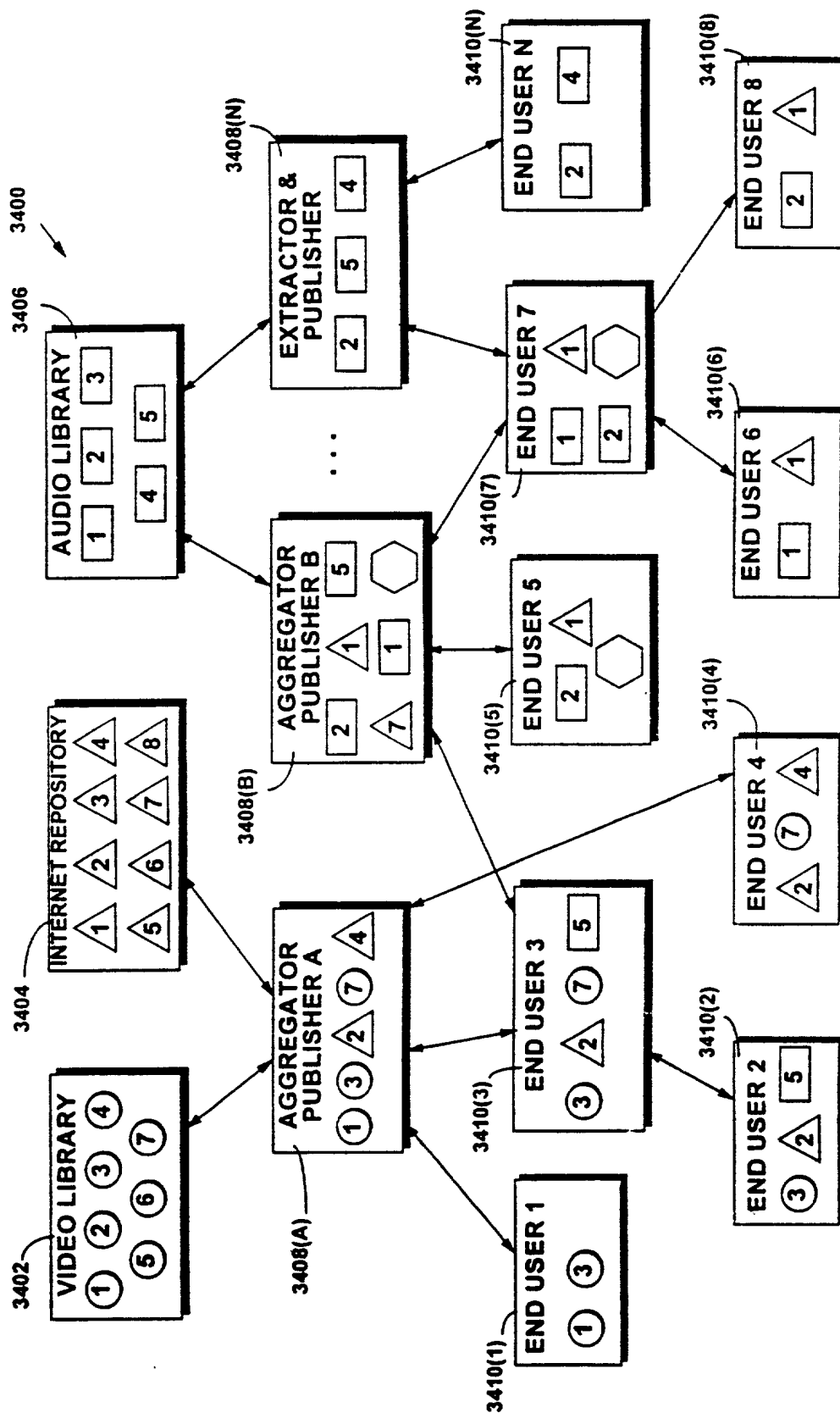


FIG. 84



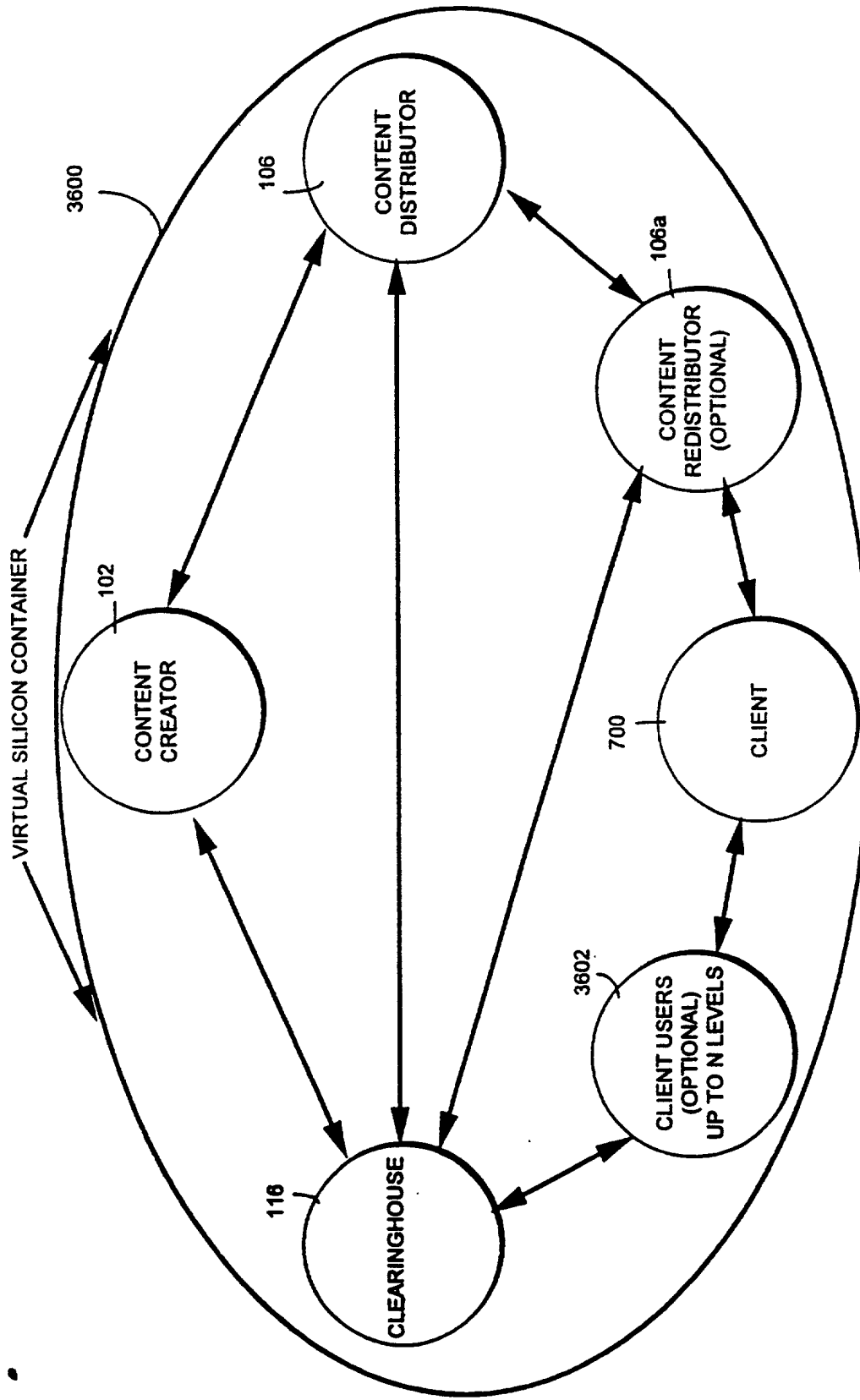


FIG. 87

FIG. 86

The diagram illustrates a content distribution system 700. A central horizontal bus connects three users (USER 112a, USER 112b, USER 112c) to a CREATOR 102 and a DISTRIBUTION PERMISSION module 3502. The CREATOR 102 outputs UNENCRYPTED CONTENT and ENCRYPTED CONTENT. The DISTRIBUTION PERMISSION module 3502 outputs DISTRIBUTION PERMISSION. A separate module 3500 outputs USAGE PERMISSIONS. The bus also carries USAGE PERMISSIONS, CONTENT, and DISTRIBUTION PERMISSIONS.

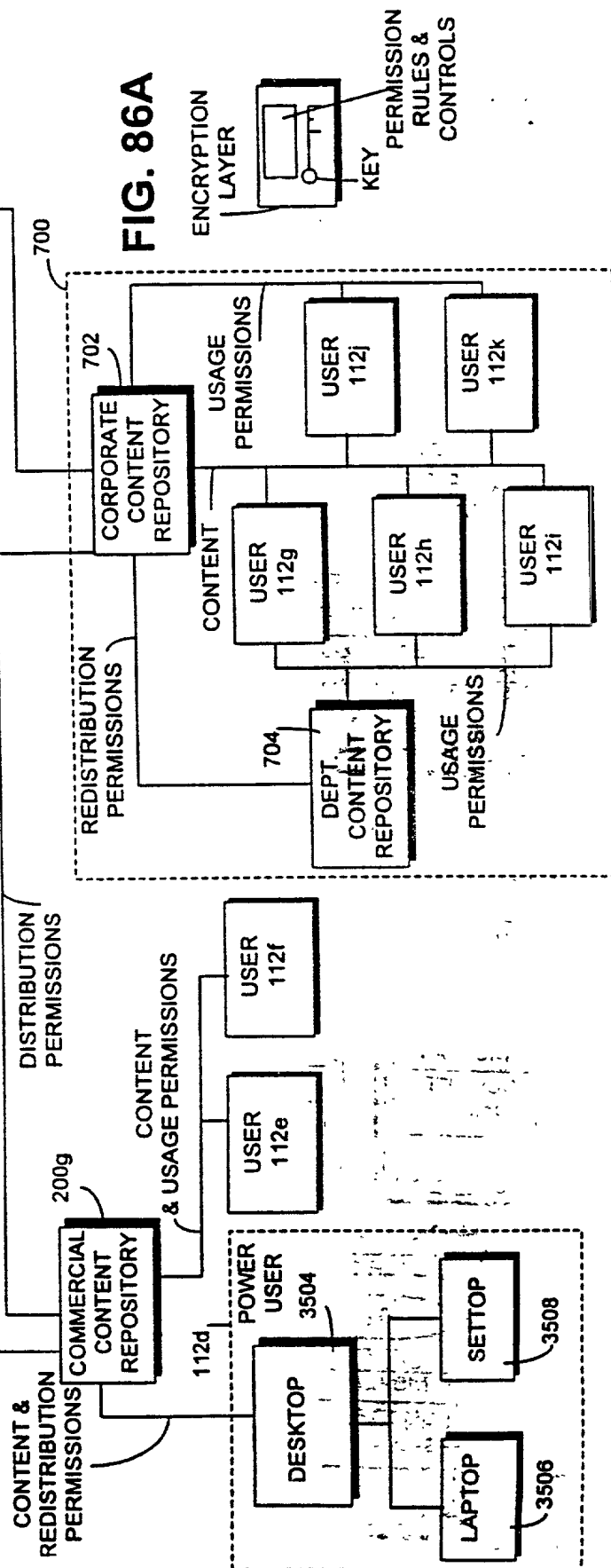


FIG. 86A